



The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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SACKETT v. EPA

US SUPREME COURT OPENS DOOR TO PRE-ENFORCEMENT REVIEW

by Richard M. Glick, Davis Wright Tremaine (Portland, OR)

INTRODUCTION

In a rare display of unity, a unanimous US Supreme Court (Court) held that recipients of US Environmental Protection Agency (EPA) compliance orders under federal Clean Water Act (CWA) section 404 are entitled to judicial review. In *Sackett v. EPA*, 566 U.S. ____ (2012) — decided March 21st — the Court rejected EPA's long held position that compliance orders are not "final" orders subject to review under the Administrative Procedures Act (APA) and that review is available only if EPA brings enforcement action for noncompliance with the order. To the contrary, the Court concluded that compliance orders meet all the standards of judicially determined final agency action and that nothing in the Clean Water Act precludes review.

BACKGROUND

The Sacketts owned land in Idaho upon which they wished to build a home. In so doing, they filled about half an acre of land that EPA determined to be jurisdictional wetlands under CWA § 404. EPA issued an order to the Sacketts to restore the site in accord with an EPA work plan, turn over records, and allow EPA access to their land. The Sacketts disagreed with the wetlands determination and requested a hearing, which was denied. They then filed an action in US District Court alleging that the order was arbitrary and capricious under the APA and had deprived them of due process under the Fifth Amendment. The District Court dismissed the claim, which was affirmed by the Ninth Circuit Court of Appeals. The Ninth Circuit found that the CWA precludes pre-enforcement review and that preclusion does not violate the constitutional guarantee of due process.

SACKETT DECISION

In an opinion written by Justice Scalia, the Supreme Court reversed in an unequivocal rejection of EPA's position. The Court considered: (a) whether EPA's order was "final" under the APA; (b) whether there was no other adequate remedy in a court; and (c) whether the CWA precludes pre-enforcement review.

Final Agency Action

EPA argued that its compliance order was not a final agency action since it invited the Sacketts to participate in an informal discussion of the order and any possible errors in the allegations. This notwithstanding, the Court observed that the order imposes legal obligations on the Sacketts and represents the "consummation" of EPA decision-making as the Sacketts were denied a hearing. The informal discussion offered by EPA did not persuade the Court.

**Sackett
v. EPA****Final Orders****Penalties Risk****Wetlands
Permit Option****Judicial Review****The Water Report**

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Writing for the Court, Justice Scalia concluded:

But [the offer of informal discussion] confers no entitlement to further agency review. The mere possibility that an agency might reconsider in light of “informal discussion” and invited contentions of inaccuracy does not suffice to make an otherwise final agency action nonfinal.

Slip Op. at 6.

Other Adequate Remedy

The APA allows review of final agency orders only if there is no alternative adequate remedy in a court. 5 U.S.C. § 704. EPA pointed out that judicial review comes when the agency brings a civil action to enforce the order. However, the Court noted that the Sacketts cannot themselves initiate the enforcement action and that the potential assessment of penalties accruing at up to \$75,000 per day places the Sacketts at an unacceptable risk. “But the Sacketts cannot initiate that process, and each day they wait for the agency to drop the hammer, they accrue, by the Government’s telling, an additional \$75,000 in potential liability.” *Slip Op.* at 6.

Although EPA did not rely on this argument, the Court acknowledged that the Sacketts could also pursue a permit with the Corps of Engineers, and then seek review if the permit is denied. However, Corps regulations make it nearly impossible to process a wetlands fill permit application pending an EPA compliance order. 33 CFR § 326.3(e)(1)(iv). Further, the Court finds this alternative avenue into a court unsatisfactory:

The remedy for denial of action that might be sought from one agency does not ordinarily provide an “adequate remedy” for action already taken by another agency.

Slip Op. at 6.

CWA Preclusion of Pre-Enforcement Review

Even though the CWA does not expressly allow judicial review, the Court cited its earlier opinion in *Block v. Community Nutrition Institute*, 467 U.S. 340, 349 (1984), that the APA creates a presumption in favor of judicial review, which may be “overcome by inferences of intent drawn from the statutory scheme as a whole.” *Slip Op.* at 7, quoting *Block*. EPA pointed to several provisions of the CWA to rebut the presumption, none of which the Court found persuasive.

First, EPA argued that the CWA authorizes EPA to pursue alternative modes of action:
the agency “shall issue an order requiring such person to comply with [the Act],
or . . . shall bring a civil action [to enforce the Act].”

Id. at 7, quoting 33 U.S.C. § 1319(a)(3).

EPA argued that since one alternative contemplates judicial action and the other administrative action, allowing parties to go to court in the former would undermine the latter. However, the Court found independent reasons for Congress to have provided for the administrative action alternative other than preclusion of judicial review, citing EPA’s argument that compliance orders offer speedy resolution and the opportunity for voluntary compliance.

The Court observed:

It is entirely consistent with this function to allow judicial review when the recipient does not choose “voluntary compliance.” The Act does not guarantee the EPA that issuing a compliance order will always be the most effective choice.

Id. at 7.

Second, EPA argued that compliance orders are not self-executing — rather, they must be enforced through judicial action. Congress, according to EPA, must have seen the orders as just part of the process and not the end point. The Court disagreed, finding that the compliance order and the denial of a hearing represents EPA’s disposition of the matter:

And it is hard for the Government to defend its claim that the issuance of the compliance order was just “a step in the deliberative process” when the agency rejected the Sacketts’ attempt to obtain a hearing and when the next step will either be taken by the Sacketts (if they comply with the order) or will involve judicial, not administrative, deliberation (if the EPA brings an enforcement action). As the text (and indeed the very name) of the compliance order makes clear, the EPA’s “deliberation” over whether the Sacketts are in violation of the Act is at an end; the agency may still have to deliberate over whether it is confident enough about this conclusion to initiate litigation, but that is a separate subject.

Id. at 8.

**Sackett
v. EPA****Compliance
Orders
&
Efficiency**

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Third, the Court was similarly dismissive of EPA's argument that express provision for judicial review in other parts of the CWA precludes implied judicial remedies where it is not provided:

But if the express provision of judicial review in one section of a long and complicated statute were alone enough to overcome the APA's presumption of reviewability for all final agency action, it would not be much of a presumption at all.

Id. The Court found the list of cases propounded by EPA in support of its position to be inapposite (not pertinent).

Fourth, EPA argued that Congress intended to make the government's water pollution control activities more efficient. Compliance orders often lead to amicable resolution and EPA asserted that inserting judicial review prior to enforcement would discourage their use. The Court was unmoved by this argument, rejecting it in strong terms:

The APA's presumption of judicial review is a repudiation of the principle that efficiency of regulation conquers all. And there is no reason to think that the Clean Water Act was uniquely designed to enable the strong-arming of regulated parties into "voluntary compliance" without the opportunity for judicial review—even judicial review of the question whether the regulated party is within the EPA's jurisdiction. Compliance orders will remain an effective means of securing prompt voluntary compliance in those many cases where there is no substantial basis to question their validity.

Id. at 9-10.

Unresolved Issues

It is important to note that the case was narrowly decided, focusing entirely on the procedural question of pre-enforcement review, and not the merits. Nor does the Court reach the due process issue. The Court specifically did not address the question of whether EPA reached the correct conclusion that the filled lands at issue were indeed jurisdictional wetlands. But Justice Scalia did note that the uncertainty surrounding wetlands determinations underlies the case. *Id.* at 2 and 5 (fn. 2).

The uncertainty of CWA jurisdiction over the Sackett's property was an important theme in concurring opinions by Justices Ginsburg and Alito, but for different reasons. Justice Ginsburg supports the right of the Sacketts to have their day in court, but the question of EPA's authority to regulate their land "remains open for another day and case." *Ginsburg Concurring Slip Op.* at 1. Justice Alito writes that the Court's decision allowing judicial review is small comfort to land owners like the Sacketts because the ambiguity remains as to how to determine which wetlands are subject to regulation. Alito recounts the Court's own tortured efforts to bring clarity — see for example, *Rapanos v. U.S.*, 547 U. S. 715 (2006) — but finds the greatest fault with Congress and EPA:

Real relief requires Congress to do what it should have done in the first place: provide a reasonably clear rule regarding the reach of the Clean Water Act. ... For 40 years, Congress has done nothing to resolve this critical ambiguity, and the EPA has not seen fit to promulgate a rule providing a clear and sufficiently limited definition of the phrase. Instead, the agency has relied on informal guidance. But far from providing clarity and predictability, the agency's latest informal guidance advises property owners that many jurisdictional determinations concerning wetlands can only be made on a case-by-case basis by EPA field staff.

Alito Concurring Slip Op. at 2.

CONCLUSION

While property owners have stronger procedural rights under the *Sackett* decision, the question remains whether the case will alter EPA's behavior in any significant way. It could cause EPA to attempt informal settlements before issuing compliance orders and may limit enforcement to instances where the agency is confident it will prevail in court. Because of the ambiguity in how jurisdictional wetlands are determined, an emphasis on early attempts at informal settlement should benefit property owners.

FOR ADDITIONAL INFORMATION:

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WEBSITE: case available at: www.supremecourt.gov/opinions/11pdf/10-1062.pdf

Municipal Water Supply Planning

MUNICIPAL WATER RESOURCES & REGIONAL PLANNING

THE PRAIRIE WATERS PROJECT — AURORA, COLORADO

by Lisa Darling, South Platte Program Manager, Aurora Water (Aurora, Co)

INTRODUCTION

The City of Aurora, Colorado (Aurora), is located on the eastern plains of Colorado, outside of Denver. Home to Buckley Air Force base and Anschutz Medical Center, Aurora has a current population of more than 335,000. Population projections show that even in today's stifled economy, more than 500,000 people

are expected to live within the Aurora's city limits by 2038. While some might think Aurora is just a "glorified suburb" of Denver, it is actually the third largest metropolitan area in the state and is projected to be the largest city in Colorado by 2075. Aurora is a "Home Rule" municipality, and its service area extends into Arapahoe, Adams, and Douglas counties. Former Aurora mayor Dennis Champine once expressed the somewhat whimsical notion that eventually the area would be called the "Aurora/Denver Metropolitan Area" (from "Aurora History," City of Aurora, Colorado). As it turns out, Champine might not be far off the mark. Since 2000, Aurora has surpassed Denver in land area with more than 150 square miles, only half of which is developed.

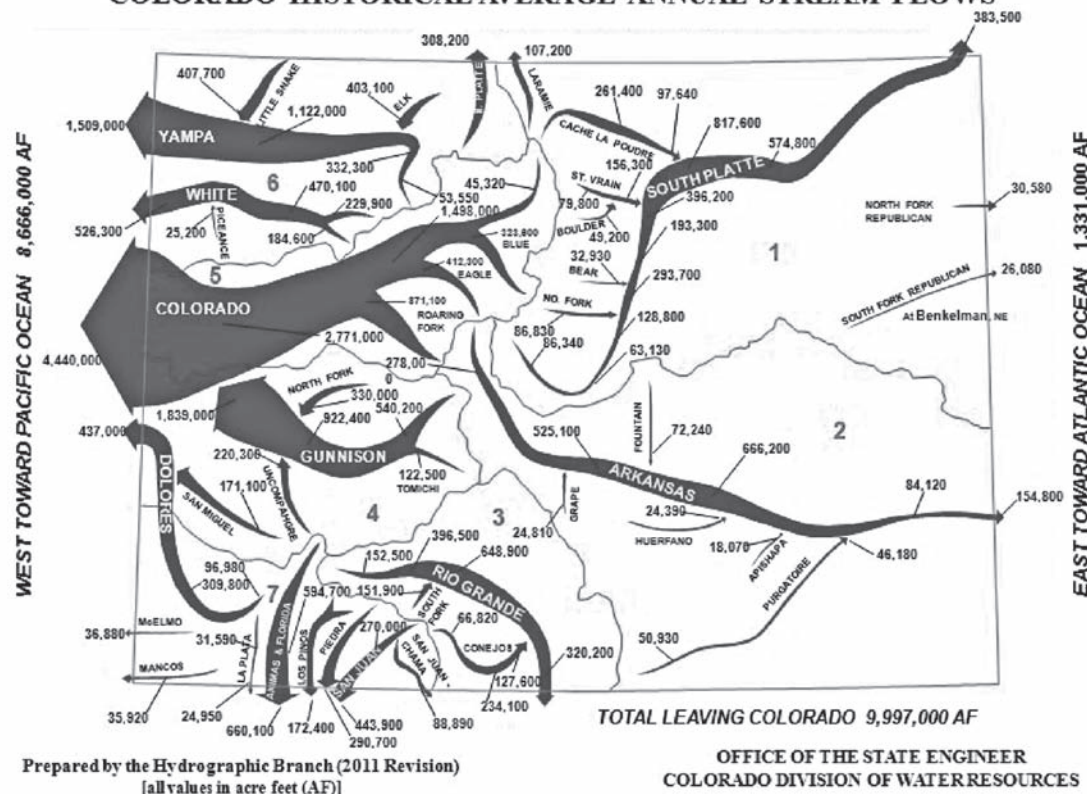
Water is a precious commodity in the western United States. Colorado is a headwater state, with more than five major rivers originating within and then leaving its borders. The big five — Colorado, Arkansas, South Platte, Rio Grande, and Yampa/White Rivers — are the most well-known. Another major

river, the Snake, originates outside of Colorado, enters Colorado's northwest corner and becomes a tributary to the Yampa.

In a state where less than 14 inches of total average precipitation is a well-accepted fact of life, one of the greatest hurdles to the development of any Colorado community is access to water. Water is truly the state's lifeblood. It is vital to support the demands of a growing population and a thriving state-wide agricultural industry, and its non-consumptive uses — boating, fishing, rafting, etc. — lures many people from other states and continually captivates visitors in Colorado's booming tourism industry.



COLORADO HISTORICAL AVERAGE ANNUAL STREAM FLOWS



AURORA'S WATER MANAGEMENT HISTORY

Municipal
Water Supply
Planning

Origins

Aurora originated in the 1880s as the town of Fletcher, taking its name from a transplanted mid-western businessman, Donald Fletcher. Fletcher saw the town as a real estate opportunity. He and his partners staked out four square miles east of Denver, but the town — and Colorado — struggled mightily after the Silver Crash of 1893. At that point, Fletcher, who was destitute, skipped town, leaving the community with — ironically — a huge water debt. Not so ironically, the townspeople decided to rename the town after one of its subdivisions. In 1907, the town became “Aurora.”

Denver
Connection

Aurora initially obtained water from a well dug by a private water company. Additional wells were dug along the banks of Sand Creek, a small tributary of the South Platte that ran through the town. However, demand soon outpaced its well supply, and Aurora turned to its sister city, Denver, to supply it with water. The arrangement was short-lived. In the 1920s, Denver drew what would later be known as the “blue line” — a line drawn on a map that designated the Denver water service area — and Denver officials would not issue water “taps” or connections outside that line. In the 1940s, Denver further limited its service to Aurora by designating streets beyond which it would no longer serve “east or south.” With no other choice, Aurora began to develop its own water system.

Sustainable
Guidelines

Aurora's Growing Water System

In the late 1950s, Aurora City Council (Council) directed its newly formed utilities department to develop long-term water supplies. Elected officials gave staff three important development guidelines: diversify; rely on renewable resources; and develop a storage system capable of firming Aurora's water supplies. The goal, in part, was to ensure that Aurora could sustain its water system through a comparable “design drought” of the 1950s.

Renewable
Supply

By having a system diverse in both supply and location, the Council knew that Aurora could withstand a number of threats, both man-made and those unforeseen “acts of God.” By relying on renewable water supplies, council foresaw an issue with the reliance upon non-tributary groundwater, a Colorado artifact that causes many of the area's water providers to confront sustainability issues to this day. [Editor's Note: “non-tributary groundwater” means underground water in an aquifer which is situated so that it neither draws from nor contributes to a natural surface stream in any measurable degree.] Non-renewable water resources are not sustainable. Many of the communities in the South Metro area, which are reliant upon non-renewable groundwater supplies, will face a very real “water crisis” if the aquifer continues to diminish.

In the late 1950s, the Council had the foresight to know that sustainability was of highest importance. By developing storage in different basins in specific locations, Aurora staff would be able to firm developed water supplies to sustain Aurora during times of scarcity. Within the Council's guidelines, Aurora began to acquire permanent supplies.

Irrigation
Purchases

Raw Water

Aurora's raw water system was designed to provide highly reliable service as a top priority. Diverse and high-quality sources of raw (i.e., untreated) water were acquired in three major river basins: the Colorado, the Arkansas and the South Platte. Beginning in the 1960s, Aurora began buying irrigation water from ranches in the upper South Platte River basin, and transferring the consumptive use portion of those rights to municipal uses. In 1967, Aurora collaborated with Colorado Springs to complete the Homestake Project — a reservoir, collection and delivery system that diverts water from Homestake Creek, a tributary of the Eagle River, eventually delivering it to Aurora's Spinney Mountain Reservoir. The development of Homestake was the largest project undertaken by either water provider at that time, with many financial and construction challenges. The construction of Spinney Mountain Reservoir, another large mountain storage facility, was completed in 1981.

Aurora's purchase of irrigation water rights in the South Park area continued into the 1990s. It was during this time, primarily the late 1970's and early 1980's, that Aurora became one of the fastest-growing cities in the United States (“Water Supply Factbook,” Aurora Water).

“Changed”
Water Rights

In 1986, the Colorado State Water Court approved a transfer of irrigation water rights from the Rocky Ford Ditch, in the Arkansas River Basin, for municipal use. Aurora subsequently acquired those water rights. Aurora also acquired an interest in changed water rights of the Colorado Canal, on the main stem of the Arkansas River. [Editor's Note: a “changed water right” refers to any change in a way a water right is used. They may be changed in type, place, time of use, point of diversion, adding points of diversion, etc. Changes of water rights must be approved by the water court to assure that no injury occurs to other water rights. In other states, the term “transfer” is sometimes used in place of “change.” In Colorado, the water

Municipal Water Supply Planning

Intrabasin Transfers

Drought "Hardening"

Variability Balanced

Storage Functions

court is a special division of the district court with a district judge designated as and called the water judge. It is his responsibility to deal with specific water law violations and matters having to do with changes in the use of water or changes in the point of diversion of a water right.]

In the 1980s and 1990s, Aurora continued to purchase and transfer water rights in a number of different basins and areas of Colorado. Aurora obtained irrigation water rights from several ranches in the upper Arkansas River Basin, near Leadville. At the same time, Aurora also bought interests in transmountain diversion projects (Twin Lakes Reservoir Company and the Busk-Ivanhoe Project) that transported water from the Colorado River on the west slope of the Rockies to the Arkansas River Basin on the east slope. In addition, irrigation water rights from the Last Chance Ditch, in the vicinity of Chatfield Reservoir on the South Platte River, were transferred to Aurora for municipal use. The Otero Pump Station was constructed as part of the Homestake Project to move the water supplies from the Arkansas/Colorado basins to the South Platte River basin for treatment and distribution. In the early 2000s, Aurora also completed the transfer of additional water rights from the lower Arkansas basin.

These transactions were all completed by the Aurora utility department's Water Resources Division, which was responsible for the development and operation of the raw water system, water resources planning, and acquisition of new water supplies. The Division's continuing objective is to ensure that Aurora always has an adequate water supply to meet customer demand. In meeting this objective, the water portfolio was developed to rely upon renewable surface water for approximately 95 percent of its raw water supply. A small remainder comes from shallow, alluvial groundwater and deep groundwater sources, the latter of which is to be used primarily for the minimization of drought effects referred to as "drought hardening." Drought hardening may include: water restrictions; gaining the ability to move previously unobtainable water; and other new projects or processes that can reduce a drought's impacts. All rights diverted from Colorado's streams and aquifers for Aurora's use are done in accordance with the city's water right decrees. Today, Aurora owns or leases water that is the subject of 40 different decrees, and includes more than 150 individual water rights.

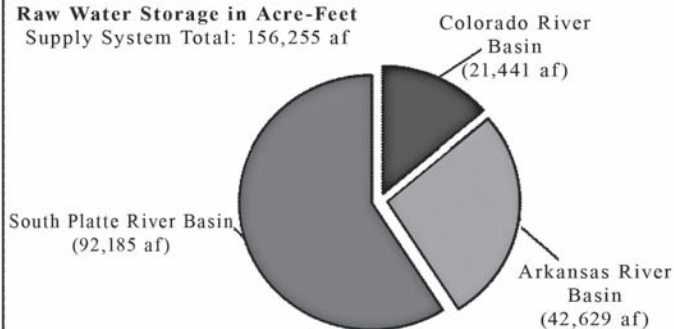
Storage of Water

Storage is essential to reliable delivery. The key feature of Aurora's water supply system — which is used to manage raw water supplies — is its series of eleven reservoirs, which store over 156,000 acre-feet in three basins. Aurora's water system was designed to use reservoir storage to balance annual variability in water yield. In an average year, total reservoir storage should remain relatively constant (excluding seasonal variability). In a dry year total water storage will decline and in a wet year storage will increase. Long-term storage trends are a good indicator of the immediate need to either acquire supplemental water or implement mandatory water conservation measures. Annual storage cycles and fluctuations are apparent because system storage reaches a minimum at the end of April and then rapidly peaks at the end of June (after snowpack runoff). This enables Aurora to use water stored during the mid- and late summer months during the winter to meet user demand.

Water storage serves two important functions: "regulation" and carry-over capacity. Water is stored

or "regulated" during peak runoff for use throughout the year. According to the Natural Resources Conservation Service (NRCS), approximately 80 percent of river runoff comes from snowmelt. The remaining 20 percent comes from summer rainfall and groundwater. Since nearly all of Aurora's water supply is accrued during the "runoff months" of May, June, and July, regulation of storage is important. High water demand continues throughout the summer and early fall. Because Colorado stream flows also vary annually, water must be able to be stored during wet years for use in dry years (i.e., "carried-over"). In Aurora's case, the approximate estimation of total storage capacity needed was three times that of the city's annual average water demand.

Raw Water Storage in Acre-Feet
Supply System Total: 156,255 af



Conservation

Water Conservation

Water conservation efforts are another important piece in the development of a new water system. Conservation became an integral part of the department's management strategy in the late 1970s. One of the original objectives of the program was to limit per capita water consumption to approximately 170 gallons per day or less, a goal achieved primarily through educational efforts promoting efficient water use.

In 2000, with a diverse supply, calculated storage, and an insightful conservation plan, Aurora seemed well prepared to meet the water challenges of the new century.

Municipal Water Supply Planning

WATER YEAR 2002

UNPRECEDENTED CONDITIONS

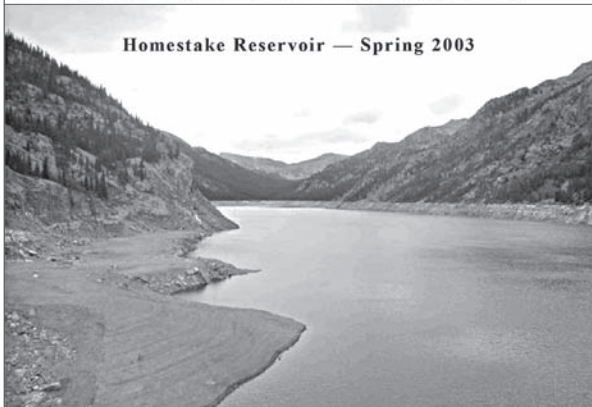
In 2002, the early winter seemed mild. In March of that year, snowpack was 70 percent of average, which was considered manageable. Typically, the season's yield forecasts are completed in the spring, based, in part, on snowpack, weather forecasts, and storage levels. However, something odd happened in the winter of water year 2002 — something that Aurora had never before experienced. The snowpack disappeared. "Starting in the last week of that March," recounts Brian Fitzpatrick, the Water Resources manager at the time, "the snowpack began to melt, evaporate. The snowpack disappeared, literally, reducing by 50 percent every week through April. By the end of the month, the snow was gone."

As is typical throughout the West, water providers' supplies in Colorado are primarily reliant upon snowpack for the resultant surface water yields of a water portfolio. Because the snow runoff season happened so early and quickly, no water rights were in priority, and none of the water could be legally stored. As part of the Prior Appropriation Doctrine and as dictated by water court decrees, the season of use for some rights had not started and thus Aurora could not legally store water during this early time period. It was a perfect storm. "We were sandbagged. We knew it would be a sub-par season, but we had no idea that it was going to become the disaster that it was," recalls Fitzpatrick.

While Aurora's Council-directed goal of designing a system that would sustain itself through a 1950s style of drought had been achieved, this level of drought under modern-era levels of demands and lower than average storage conditions entering into the 2002 drought had never been historically experienced. Water providers, including Aurora, were caught unaware and unprepared. Although conservation and demand management programs had been in place for many years, the focus of those programs was education. Educational programs tend to show results over time, but quick action was needed. The low stream flow and hot, dry conditions continued through the season. By March of 2003, Aurora was in the untenable situation of having just 26 percent of storage volume filled — approximately one year of indoor water use for the city's residents.

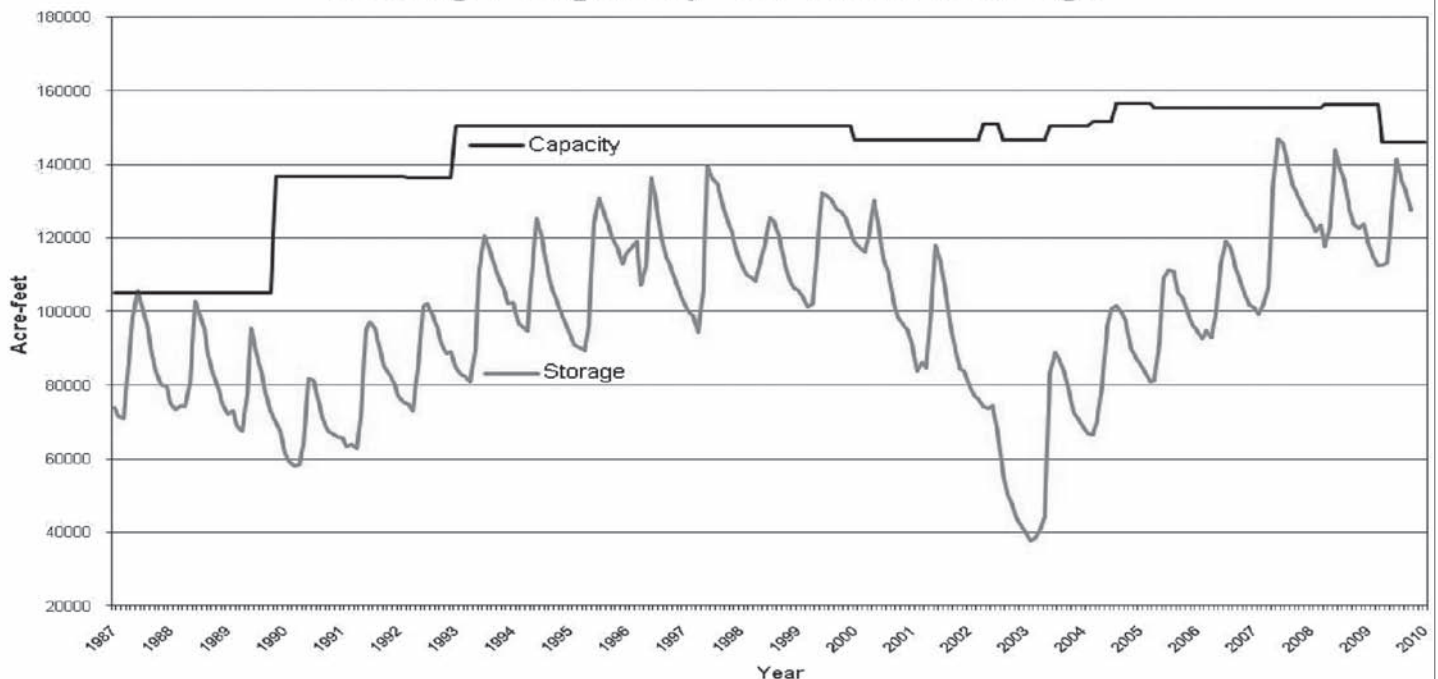


South Platte River — Summer 2002



Homestake Reservoir — Spring 2003

Storage Capacity vs. Total Storage



Municipal Water Supply Planning

Drought History

Colorado Droughts		
When	Worst Years	Major State Impact Areas
1890-1894	1890 and 1894	East of mountains
1898-1904	1902-1904	Southwestern Colorado
1930-1940	1931-1934, 1939	Widespread, severe and longest lasting drought in Colorado (the Dust Bowl era)
1950-1956	1950, 1954-1956	Statewide drought - worse than the 1930s in Front Range (often used by Front Range utilities, including Aurora, as the "drought of record.")
1974-1978	1976-1977	Statewide, driest winter in recorded history for Colorado's high country and Western Slope
1980-1981	Winter 1980-1981	Mountains and West Slope
2000-2003	2001-2002	Significant multi-year statewide drought, with many areas experiencing the most severe conditions in Colorado recorded history

Expedited Planning

2003 Drought Response

In 2003, Aurora staff realized that something needed to be done quickly to both stabilize supplies and recover lost yields. The city quickly embarked on an expedited Integrated Resources Plan (IRP). Due to the system's drought vulnerability, the 2003 IRP had to be completed within six months. For participants, the search for a solution quickly became as dramatic as the drought that was necessitating the effort.

More than 50 projects were assessed using a comprehensive screening process. These projects' expected yields ranged from 2,000 to 48,000 acre-feet. Every basin of origin was considered — Arkansas, Colorado, and the South Platte. Every project was made to employ more advanced demand management tools and include forecasting.

Officials had several key criteria to consider when evaluating the various possibilities. Each project — or projects — had to be affordable, with reasonable capital and operating cost estimates. Selected projects had to be institutionally supportable. Environment impacts and required permitting needed to be considered. Chosen projects also had to be both sustainable and expandable, with a firm yield and manageable risk. Staff needed to be creative and adaptable: could some existing infrastructure be re-engineered or re-operated?

Project Criteria

Rejected Projects

Some of the potential projects were rejected because they did not meet one or more of the critical criteria. Several assessed projects required water court applications under Colorado's water rights system, which can be time-intensive and costly for very little resulting yield. For example, a new application was filed upon Strontia Springs Reservoir, a shared facility with Denver Water, for a junior water and storage appropriation. (This right was successfully appropriated in 2007.) Other projects that were considered included additional storage facilities along the South Platte River developed from reclaimed gravel mining operations, as well as additional terminal storage near existing city treatment facilities. Projects that were joint efforts with other water providers, or those that required extensive permitting requirements were also considered; however, none of these projects were the selected alternative because of costs, permitting issues, or lack of development control.

In 2004, officials selected the South Platte Project, which was later renamed the Prairie Waters Project. Project development began immediately.

THE PRAIRIE WATERS PROJECT

Project Details

The Prairie Waters Project consists of a North Campus facility of alluvial wells and natural pretreatment; 34 miles of mortar-lined, urethane-coated steel pipeline; three pumping stations; and a state-of-the-art 50 million gallon per day (MGD) ultraviolet oxidation purification facility located near Aurora Reservoir. There are four above-ground storage tanks for the project holding a total of 18 million gallons of water. A total of 22 tunnels were constructed under roadways, waterways, and railroad crossings to mitigate impacts to the surrounding community and protect sensitive environmental areas. It took construction crews about one week to tunnel about 260 feet under the South Platte River, the longest tunnel crossing.

Project Pluses

Despite being ambitious, Prairie Waters seemed tailor-made for Aurora. The project embraced a responsible use of resources, while maximizing the use of in-basin renewable resources. It negated the need to develop a trans-basin diversion from Colorado's west slope — which had significant political opposition. The waters moved by the project were reusable return flows from Aurora's already owned and decreed water rights. River water quality could be maintained because there was no waste (brine) discharge from a reverse osmosis plant. Instead, Prairie Waters used alluvial filtration and other natural

Municipal Water Supply Planning

Reusable Supply

Reusable Return Flows

Aquifer Recharge

Ultraviolet Oxidation

treatment processes. It avoided impacts to local wildlife landscapes, maintaining rural open space and river corridor habitats. The natural purification resulting from the use of an Aquifer Recharge and Recovery system exceeded current water quality regulations and increased reliability in the later treatment stages. The Project required no significant federal permits, and local municipalities and county jurisdictions supported the project through cooperative agreements. Perhaps most importantly, the project was practical — utilizing more than \$300 million in reusable water supplies not previously captured and used.

Colorado's water rights system is based on the Prior Appropriation Doctrine ("first-in-time, first-in-right"). The centuries-old practice has given rise to many protracted trials and contentious battles in Colorado as elsewhere. Battles between both geographic areas (east versus west slope) and types of users (agricultural, municipal, industrial, non-consumptive) have been typical. Operationally, the Prairie Waters Project (Project) used already decreed supplies, though it did require water court approval for a "Plan for Augmentation" for the alluvial well field that diverted the reusable return flows into the Project system. A Plan for Augmentation to replace out-of-priority depletions in time, quantity and location was drafted. The application was approved in 2009 (available upon request from the author). Prairie Waters was fully operational in 2010. Prairie Waters uses both natural cleansing processes and state-of-the-art purification technology to deliver an additional 3.3 billion gallons of water per year to help meet Aurora's needs.

Prairie Waters Project – North Campus

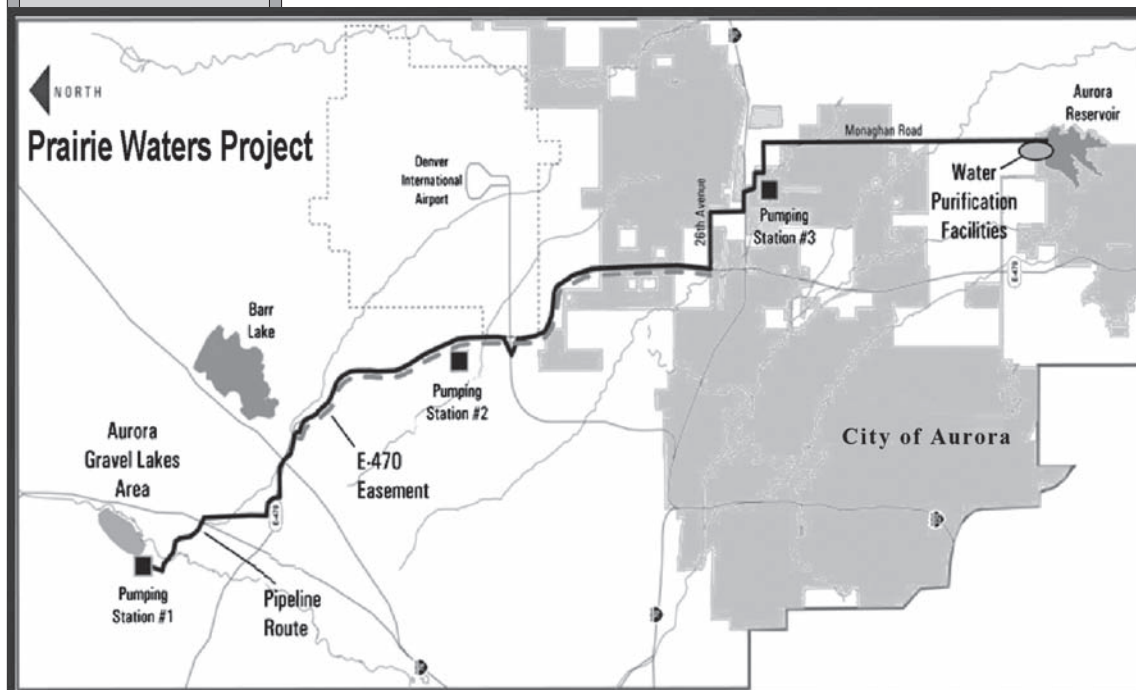
The northern-most diversion point of the Prairie Waters Project is near Brighton, Colorado. Forty-two alluvial wells were decreed (by the water court) to divert Aurora's reusable return flows from the South Platte River. Of those forty-two wells, seventeen are currently drilled and operational. The alluvial wells serve to remove pathogens, trace organics, and micro-pollutants, as well as nitrates. The water is then moved into an Aquifer Recharge and Recovery (ARR) basin. A series of recharge basins within the low-permeability ARR walls then collects the water, and perimeter wells within the ARR facility slowly draws the water through the encased alluvium and in-situ aggregates, achieving additional natural water purification. Collector wells then transport the supply to the pipeline for transport to the purification facility located in Aurora.

The seventeen riverbank filtration wells in the North Campus are each placed on average 300 feet from the river. Riverbank wells average from 30 to 50 feet deep. Water travels through the area's natural sand and gravel an average of about 10 days for natural treatment during Riverbank filtration and an additional 30 days to pass through the aquifer recharge and recovery process.

Peter D. Binney Water Purification Facility

The Peter D. Binney Water Purification Facility (Binney) uses ultraviolet (UV) oxidation (high-intensity ultraviolet light) processes, along with chemical softening and filtration to treat the water to the highest state and federal standards. There are 6,912 ultraviolet bulbs that sit in a specially designed quartz sleeves for advanced UV oxidation. The facility has a capacity of 50 MGD, and like the rest of the Prairie Waters Project facilities, is expandable to 100 MGD. The facility blends supply from Aurora's

existing mountain water sources (surface water) with the Prairies Waters Project supply to achieve a uniform supply for distribution to the city's service area. Water from the Project is not stored in the Aurora Reservoir; rather it is used to augment existing supplies in the reservoir. The North Campus, along with the Binney Water Purification Facility, offers the most protective multi-barrier purification treatment approach in the nation. Binney is currently one of the nation's largest UV treatment facilities.



WATER RESOURCE PLANNING

Municipal
Water Supply
PlanningSupply
Modeling“Demand
Triggers”

Firm Yield

Planning
FactorsExcess
Capacity SaleDrought
Hardening
Purposes**Aurora Water Planning**

The 2002 water year did not simply demonstrate the need for new, sustainable projects — it also illustrated the need for a more defined Water Resources Planning process. Now, in 2012, Aurora Water uses raw water supply modeling, as well as historical information, to evaluate the system’s ability to serve current customers and plan for future growth. The current raw water supply system and potential future projects are modeled over a historic hydrologic period of 1950-2008, representing a wide range of conditions, including two severe drought periods (1950s and 2000s).

Alfredo Rodriguez, Aurora Water Resources Project Manager, cautions others not to become over-reliant on simple model results. “One must take into account people’s real life experience, along with the hydrologic conditions, water rights issues, financial drivers — it’s an iterative process which must be updated constantly.”

Projects are prioritized and sequenced to maximize the benefit to the overall raw water system, and are then estimated through a capital projects development program for financing. Population projections and anticipated water usage rates are included in these evaluations. The timing for recommended projects is now based on “demand triggers” — i.e. when demand exceeds firm yield supply — rather than a specific year or circumstance. The planning process is dynamic in nature, with adjustments made as warranted by changing conditions, city policy, regulatory considerations, and economic factors. Adaptive management practices allow changes to the timing of projects based on actual population growth, conservation, climate variability, or other factors that affect water supply, as well as changes in projected revenues used to finance the projects. “*Water Resources Planning Process, 20 Year CIP, and Appendix for Treatment Master Plan*” Alfredo Rodriguez, P.E., Matthew Becker, E.I., Aurora Water, 2012.

Aurora’s existing water delivery system includes the city’s current water rights, storage reservoirs, and the delivery infrastructure available to meet water demands. The existing water portfolio, including the Prairie Waters Project, can meet an annual firm yield demand of 66,300 acre-feet per year (af/yr). Aurora defines “firm yield” as the largest supply that can be met each and every year, with a minimum reserved storage volume equal to a one-year supply at a restricted demand level of 135 gallons per capita per day (gpcd) or a two-day-a-week restricted watering schedule. This portfolio can serve a population of approximately 368,000 people at a usage rate of 160 gpcd — which is the rate used for conservative planning purposes.

Very similar to the process used in 2003, potential future projects are being identified and evaluated based on a variety of factors, including: permitting considerations; reliability; sustainability; overall benefits; costs; and construction feasibility. The benefits of each project are evaluated using a water resources model. The cost of each project is determined by an engineering cost estimate based on similar projects and current material and construction costs. In order to determine the sequence of multiple projects, a matrix of model runs is performed. Projects are then funded using a combination of rates and revenue projections based on the identified growth rates. Through its planning process, Aurora has positioned itself to respond to climatic, economic, and regulatory uncertainty while meeting the stated goal of providing quality water service to its customers.

Partnerships & Regional Planning

Once Prairie Waters was completed, Aurora found itself in an enviable yet difficult position. Snowfall that occurred in the late spring of 2003 began the system’s recovery after the yield decimation of 2002; conservation and demand management further reduced demands, lowering amount of water drawn from storage facilities.

Aurora’s system had fully recovered, and the Prairie Waters Project was in place for drought hardening. However, at that point there was a large financial obligation for the city to bear. Prairie Waters was completed ahead of schedule and is projected to be about \$101 million under budget — but nonetheless cost more than \$650 million to construct.

While Aurora officials knew the city would eventually “grow into” the available capacity and would continue to be protected in times of drought, the concept of selling the excess capacity in the intervening time was an intriguing one. Furthermore, there would always be times of excess capacity and supply as Prairie Waters was designed to provide drought-hardening and would not be fully utilized by Aurora during wet or even average years.

Aurora had ample experience participating in partnership opportunities with other public agencies and private entities. Such collaborations can often reduce costs, foster joint development of water supplies, and increase operational efficiencies. In addition, partnerships can minimize the impact of declining regional growth, which results in reduced development fee revenue, providing an avenue for sharing the increasing cost of acquisition and development.

Municipal Water Supply Planning

WISE Partnership

Partnership agreements must, obviously, help all of the parties involved gain some tangible or intangible benefit. Tangible benefits could include acquisition of an asset that would be unattainable or more costly without the partnership. An intangible benefit might be the establishment of a working relationship with another agency that could provide future tangible benefits to a water provider.

Among water providers in the Denver metro region, there was an increased awareness that independent projects built by single water providers are no longer the most economically viable approach. Regional cooperation has been an emerging trend in the nation and Aurora officials recognized the benefits of working together to find common solutions. For those reasons, and many others, discussions about forming the Water Infrastructure and Supply Efficiency (WISE) Partnership began.

WISE is the result of several years of analysis and discussions among the multiple water providers, including Aurora Water, Denver Water, and the South Metro Water Supply Authority ("South Metro" — which represents 15 water providers in Douglas and Arapahoe Counties). Aurora Water's Prairie Waters system provides the backbone for the partnership. While the agreement provides for water deliveries to South Metro at varying levels, it also recognizes that Aurora's first priority is serving its customers, so in times of need, Aurora will keep the water within its own system. Revenues from this partnership will help Aurora Water pay for and expand Prairie Waters. These revenues will also help stabilize Aurora water rates.

Solution Options

WISE has developed and proposed a water delivery agreement that, if approved, can provide South Metro with water each year so they can reduce their reliance on aquifers (underground water supplies that are non-renewable). Denver Water will also provide available reusable supplies of their own to the WISE partnership and share in some of the infrastructure costs. In exchange, Denver Water will be able to share some of Aurora Water's delivery and treatment system, which will allow them to use their available water supply in the lower South Platte.

If approved, the WISE Agreement will be one of the first of its kind in the country. It will be a critical step toward bolstering water supplies in the Colorado Front Range southern area, while better utilizing water resources in Aurora and Denver. Negotiations are on-going, but it is anticipated that the Agreement could be finalized by the end of 2012.

Opportunity Assessments

Many other future partnerships will be considered and pursued if advantageous to Aurora and other parties. A careful and thorough evaluation of impacts and potential unintended impacts must be a part of the decision making process. Partnership opportunity assessments — including analysis of their effects on infrastructure, water resources, demands, and operational efficiencies — are anticipated to be included in an updated Integrated Resources Plan, which Aurora expects to begin developing this year.

STRATEGIC ISSUES

In 2011, the director of Aurora's water utilities department (Aurora Water) compiled a list of strategic issues that he felt are the challenges facing water providers, and more specifically Aurora, in the years ahead. By identifying those broad issues Aurora Water hopes to create action plans that will appropriately address them. Many of the strategic issues and future action plans are reliant upon the development of response plans of other issues. *Strategic Planning Memorandum*, Aurora Water, 2011.

THE STRATEGIC ISSUES WERE IDENTIFIED AS FOLLOWS:

- **FINANCIAL VIABILITY:** For Aurora Water to continue its success, it must provide water services that meet the demands of customers and protect public health and the environment in a financially responsible and sustainable manner. By continuing partnership efforts such as WISE, continuing to minimize costs, and seek out new innovation, and by instituting asset management and costs control strategies, Aurora Water can continue to be a financially strong and stable organization.
- **ASSET MANAGEMENT:** As the city's water system continues to grow, develop, and age, a more sophisticated, adaptable tracking and management system is required. Tracking the existing infrastructure lends itself to the development of a more detailed Capital Improvements Plan, whereby additional projects can be prioritized and planned in a timely manner.
- **OPERATIONAL COSTS:** This strategic issue addresses both chemical and power costs associated with the operations of the 54th largest utility in the country. Water-related energy costs include conveyance, storage, treatment, and distribution expenses. The cost to provide power is second only to personnel costs in the utilities operational budget. Chemicals used in the treatment process are also costly and heavily regulated. This area of utility management has significant budgetary impact, so minimizing costs is a critical consideration.
- **PARTNERSHIP OPPORTUNITIES:** This strategic issue will focus on the city's ability to collaborate with others in a way that is advantageous to all parties.

Future Challenges

Chemical & Power Costs

Municipal Water Supply Planning

Climate Change

Succession Planning

- **REGULATORY MODIFICATIONS:** At both the state and federal levels, regulations related to water collection and treatment, as well as air quality, are constantly being promulgated and changed. Monitoring these efforts, and staying abreast of upcoming regulatory advances, necessitates careful attention. Collecting and reporting data is imperative to meeting permit requirements.
- **CLIMATE VARIABILITY IMPACTS:** There is probably little doubt that the earth's climate is variable. Some believe that the modern trend is toward warming. Whatever the cause, there is no doubt that a change in weather patterns in Colorado will have a direct and perhaps significant impact on the yields of water rights, the water quality in source water streams and rivers, and the need for storage. Given that much of the state's water resource is over-allocated today, any possible change needs to be incorporated in future planning scenarios.
- **WATER CONSERVATION:** Aurora Water is recognized nationwide as a leader in conservation efforts. While education is still a primary program focus, the program has expanded since its inception to provide rebate programs, audits, enforcement of watering restrictions, and other demand management tools. Aurora continues to support the development of new conservation concepts to realize further savings strategies.
- **COMPENSATION AND BENEFITS:** Recent economic changes in the job market have somewhat stifled the organization's ability to be fully competitive in attracting new staff. There is a city-wide effort to look at sustainable compensation packages and benefit offerings for staff retention.
- **STAFF RETENTION, SUCCESSION PLANNING, TRAINING, AND EDUCATION:** In concert with the issue discussed above for Compensation and Benefits, this strategic initiative subject is possibly the most broad and complex of any identified for further investigation. For example, there is a large number of both professional and operations class employees who will be retiring within the next 5-10 years, but there is little succession planning or training programs in place for a planned transition. In-house supervisory training programs are available, but the recent economic downturn has caused programs that support outside training such as tuition reimbursement or certificate programs to be suspended. Online training opportunities that minimize costs are being assessed for future program development.
- **CUSTOMER SERVICE:** Customer service is one of the Department's core mission goals and needs to be continually assessed for success and improvement. New social media tools are already being utilized as a means to communicate with external citizens and other stakeholders, as well as intra- and inter-departmental staff.

The Aurora Water management team is forming work groups that will address these strategic issues with detailed action plans and recommendations over the next 24 months.

CONCLUSION

The Prairie Waters Project was completed within five years, but the pursuit of new water supplies for Aurora's growing population will continue to be a major challenge. The number of issues that must be resolved in order to successfully complete a project has substantially increased during the past 20 years. Strategic issues must be proactively addressed. Project proponents must be prepared to effectively resolve the concerns of many diverse interests that have multiple objectives, and be willing to consider cooperative arrangements for project success. Aurora's water supply program is one that focuses first on maximizing local water supplies, including recycling and conservation. Aurora's Water Resources Division is committed to pursuing these water sources in an environmentally and socially sensitive manner that adequately addresses public concerns while protecting the needs of all Aurora citizens. By using foresight, careful use of resources, and innovation, Aurora Water will continue its history of value-based success.

The author wishes to give the sincerest thanks to Gabi Johnston for her help with this article.

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Stormwater Permits

Permits Confluence

Fundamental Questions

Command & Control Approach

NPDES Approach

While Mr. Bryden enjoys a fulfilling career working in water quality at Kennedy/Jenks Consultants, the opinions expressed, over-simplifications made, and any errors within this article are entirely his own.

INDUSTRIAL STORMWATER PERMITTING

STATUS AND TRENDS IN WESTERN STATES

by Gregg Bryden, Kennedy/Jenks Consultants (Portland, OR)

INTRODUCTION

The federal Clean Water Act (CWA) celebrates its 40th anniversary in 2012, yet fundamental issues regarding how to best manage non-point source discharges to surface water — stormwater — remain unresolved. Controversy and litigation over industrial stormwater management policy in the western US persists and the art and science behind the policy continues to evolve. Washington State's Industrial General Stormwater Permit has been in effect for over two years (but is still being litigated and revised). Oregon's new General Permit will become effective in July 2012, and California is close to issuing a new draft Industrial General Permit. In addition, many Phase I and II Municipal Separate Storm Sewer Systems (MS4s) that, among other things, regulate industrial discharges to municipal stormwater collection systems are up for revisions on their five-year permit term cycles. This confluence of past, present, and future stormwater permits provides an opportune moment to step back and review where stormwater permitting has been and where it is going. More importantly, we now have at least partial understanding of the issues to help answer these fundamental questions about stormwater management policy:

FUNDAMENTAL QUESTIONS INCLUDE:

- Are the management practices codified in current permits effectively meeting the goals of preserving and restoring the beneficial uses of our surface waters?
- Do our current management practices adequately address the larger picture of localized and global habitat effects on beneficial uses, including climate change?
- Does the policy trajectory we currently follow make the best use of limited financial and societal resources to bring about the desired results?

Stormwater management was effectively brought under the CWA beginning in 1987. Technology and water sciences have progressed significantly in the last 25 years. However, current permitting policies continue to follow more of the same command-and-control approach to stormwater, with ever more difficult-to-meet standards and increasing costs for monitoring, management and treatment.

Given the contention over new and draft stormwater permits, and global lagging economic conditions, now is a good time to review and ask — in the spirit of continuous improvement — if there are better ways to reach our surface water quality goals that improve habitat, control quantity, and create rather than hinder sustainable growth in the urban areas that require stormwater management.

NATIONAL ACADEMIES REVIEW FINDINGS

In its report on Urban Stormwater Management in the United States made to Congress in October 2008, the National Academies National Research Council conducted a comprehensive review of permit based stormwater management practices in the US and concluded that the CWA's National Pollutant Discharge Elimination System (NPDES) approach, using a one-size fits all industrial general stormwater permit approach, is not working. Because of lack of information, there is uncertainty over the performance and longevity of current stormwater control measures. Given the innate variability of comparing stormwater data to benchmarks, "it is unclear whether these exceedances provide useful indicators of potential water quality problems." Finally, there will never be sufficient resources for regulatory agencies to review and enforce existing regulations for the estimated half-million entities in the US subject to stormwater permitting.

The National Academies recognized that managing stormwater is a difficult prospect because of the highly variable nature of storms, runoff quality, and human behavior.

THE NATIONAL ACADEMIES STUDY AUTHORS CONCLUDED:

EPA's current approach to regulating stormwater is unlikely to produce an accurate or complete picture of the extent of the problem. Nor is it likely to adequately control stormwater's contribution to waterbody impairment. The lack of rigorous end-of-pipe monitoring, coupled with EPA's failure to use flow or alternative measures for regulating stormwater, make it difficult for EPA to develop enforceable requirements for stormwater dischargers.

The National Academies report does provide recommendations for improving the current programs, including some out-of-the box (or rather, out of the end-of-pipe) thinking.

Stormwater Permits

National Academies' Conclusions

THE NATIONAL ACADEMIES' RECOMMENDATIONS INCLUDED:

- Flow and related parameters, such as impervious cover, should be considered for use as proxies for stormwater pollutant loading.
- EPA should engage in much more vigilant regulatory oversight in the national licensing of products that contribute significantly to stormwater pollution.
- The protection of aquatic life in urban streams requires an approach that incorporates all stressors.
- The full distribution and sequence of flows (i.e., the flow regime) should be taken into consideration when assessing the impact of stormwater on streams.
- Individual controls on stormwater discharges are inadequate as the sole solution to stormwater in urban watersheds.
- Nonstructural stormwater control measures (SCMs) such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant load from a new development.
- SCMs that harvest, infiltrate, and evapotranspire stormwater are critical to reducing the volume and pollutant loading of small storms.

CURRENT WESTERN US STORMWATER PERMITS TRENDS

How are western region stormwater permits changing in light of the National Academies' recommendations? A quick look at the US Environmental Protection Agency (EPA) and western states permits suggest that the recommendations are being largely ignored. This is partially a result of the nature of how these permits have come about — through litigation that focuses on monitoring and enforceable limits rather than careful science-based policy development. Both the Washington and Oregon permits were developed under Settlement Agreements that arose out of appeals or litigation (Washington: *Puget Soundkeeper Alliance, et al. v. State of Washington, et al.*, PCHB Nos. 07-22 and 07-23 (Feb. 2, 2009); and Oregon: *Northwest Environmental Defense Center, et al. v. Oregon Dept. of Environmental Quality, et al.*, Multnomah County Circuit Court Case No. 0801-00974 and *Northwest Environmental Defense Center, et al. v. Oregon Dept. of Environmental Quality, et al.*, Multnomah County Circuit Court Case No. 0703-03342, without prejudice).

While the permit revision process in Oregon and Washington involved a collaborative process using stakeholder meetings, the committees' hands were somewhat tied, having to address specific issues related to benchmarks and water quality standards included in the Settlement Agreements.

As a result of litigation, newer permits are shifting from using benchmarks as a measure of Best Management Practices (BMPs) to using benchmarks as surrogates for effluent limits based on water quality standards. When the CWA was amended in 1987 to include stormwater discharges, the intention of using benchmarks in the initial stormwater permits was as a means to assess the effectiveness of BMPs. BMPs were presumed to be effective at protecting water quality standards and benchmarks were established to demonstrate that BMPs were being properly implemented. This approach, rather than setting firm effluent limits, was adopted in recognition of the highly variable nature of stormwater runoff and receiving water conditions during transient precipitation events — as opposed to the more steady state conditions of traditional discharges from wastewater treatment plants, which can be directly tied to meeting water quality standards.

The table below summarizes the large changes in benchmarks for metals between the current and new Oregon general industrial (1200-Z) permits.

Table 1. Oregon and Washington Benchmark Value Comparison

Benchmark Parameter	Benchmark Values (micrograms per liter (µg/l) unless noted)		
	Current Oregon 1200-Z	New Oregon 1200-Z	Washington ISGP
Total Copper	100	20	Western: 14; Eastern: 32
Total Lead	400	40	No Benchmark
Total Zinc	600	120	117
pH (units)	5.5 - 9.0	unchanged	5.0 - 9.0
Total Suspended Solids	130,000	100,000	No Benchmark
Total Oil & Grease	10,000	unchanged	No Benchmark, look for sheen
E.coli	406 counts/100 ml	Unchanged	No Benchmark
Turbidity (NTU)	No Benchmark	No Benchmark	25

Litigation Driven Permits

BMPs & Stormwater Variables

Stormwater Permits

Risk-Based Modeling

California Permit

Numeric Action Levels

As described in the *Permit Evaluation Report* for the new Oregon industrial stormwater permits (DEQ 2011), the new metals benchmarks for lead and zinc were based on risk-based modeling of receiving and effluent conditions meeting ambient water quality standards. This approach was adapted from the model used to generate the Washington State benchmarks (Herrera 2009). The modeling used Monte Carlo simulations in which ambient water quality characteristics were used to generate a large number of stream and stormwater discharge mixing scenarios. [Editor's Note: Monte Carlo simulations (or Monte Carlo methods or experiments) are a class of computational algorithms that rely on repeated random sampling to compute their results. Monte Carlo methods are often used in computer simulations of physical and mathematical systems. These methods are most suited to calculation by a computer and tend to be used when it is infeasible to compute an exact result with a deterministic algorithm. This method is also used to complement theoretical derivations.] These mixing scenarios were contrasted against variable, hardness dependent, acute water quality criteria to evaluate the likelihood of an exceedance of water quality criteria. Model inputs included variable upstream metals concentration, variable hardness concentration, constant dilution factor of five, and variable stormwater runoff concentrations. Because risk-based modeling resulted in an unachievable low benchmark of 6 micrograms per liter (µg/l) for copper, Oregon opted for a technology-based copper limit. The 20 µg/l total copper benchmark for the 1200-Z permit corresponds to the 75th percentile of effluent concentrations for the 25–50 µg/l influent range treated by passive media filter BMPs based on data from the International Stormwater BMP Database.

California's 2011 draft Stormwater General Industrial permit uses Numeric Action Levels (NALs) that can escalate into Numeric Effluent Limitations (NELs) if a facility repeatedly fails to meet the NALs. The draft California permit requires monitoring for potential pollutants based on a facility source assessment. Monitoring is required for any of the NALs listed in Table 2 below, based on the potential of presence at a given facility.

Table 2. Draft California General Industrial Stormwater Permit Numeric Action Levels/Numeric Effluent Limits

Parameter	NAL Value	Reporting Units
pH units	6.0-9.0	pH Units
Suspended Solids (TSS)*, Total	100	mg/l
Specific Conductance (S/C)*	200	umhos/cm
Oil & Grease (TOG)*, Total	15	mg/l
Organic Carbon (TOC), Total	110	mg/l
Zinc, Total (H)	260**	µg/l
Copper, Total (H)	33.2**	µg/l
Lead, Total (H)	26.2**	µg/l
Chemical Oxygen Demand	120	mg/l
Aluminum, Total (pH 6.5-9.0)	750	µg/l
Iron, Total	1,000	µg/l
Nitrate + Nitrite Nitrogen	0.68	mg/l as N
Total Phosphorus	2	mg/l as P
Ammonia	19	mg/l
Magnesium, total	63.6	µg/l
Arsenic, Total (c)	168.54	µg/l
Cadmium, Total (H)	5.3**	µg/l
Nickel, Total (H)	1,020**	µg/l
Mercury, Total	2.4	µg/l
Selenium, Total	238.5	µg/l
Silver, Total (H)	18.3**	µg/l
Biochemical Oxygen Demand	30	mg/l

* Minimum monitoring parameter required in permit.

** Metal values can be adjusted for hardness of receiving water in some cases.

Multi-Sector General Permits (MSGPs) for Industrial Stormwater Discharges

FEDERAL INFLUENCE ON STATE PERMITS

The Federal MSGP, effective May 2009, applies only to states not delegated by EPA to administer CWA/NPDES programs (including Alaska, Idaho and New Mexico in the west) as well as Indian Country and federal lands. However, portions of the federal permit, including industry sector-specific requirements, have been incorporated into state permits. Oregon's new stormwater permits include technology-based effluent limits for sectors where the EPA has developed effluent limitation guidelines, including: runoff from asphalt emulsion facilities; material storage at cement manufacturing facilities; hazardous and non-hazardous waste landfills; and coal storage piles. Oregon's numeric effluents do not specifically cite EPA's effluent limits for log deck runoff at forest products facilities or mine dewatering activities; however, these limits (e.g., pH and woody debris) are captured in general discharge prohibitions.

Federal Influence

**Stormwater
Permits****Sector-Specific
Best Practices****Oregon
Requirements****Washington
Benchmarks****NPDES Permit
Coverage****TMDL Backlog****Permit Denial****Columbia
Slough****Oregon TMDL
Limits****California
Requirements**

The new Oregon industrial stormwater permits also include industry sector-specific requirements, including sector-specific best practices (Technology Based Effluent Limits) that are mostly operational control measures associated with the industry sector. These sectors include: Timber Products, Paper and Allied Products, Chemicals and Allied Products; Asphalt Paving and Roofing Materials; Glass, Clay, Cement, Concrete and Gypsum Products; Primary Metals; Metal Mining; Coal Mining; Oil and Gas Extraction and Refining; Mineral Mining; Hazardous Waste Treatment, Storage, and Disposal Facilities; Landfills and Land Application Site and Open Dumps; Automobile Salvage Yards, Scrap Recycling Facilities; Steam Electric Generating Facilities; Land Transportation and Warehousing; Water Transportation; Ship and Boat Building and Repairing Yards; Air Transportation Facilities; Treatment Works; Food and Kindred Products; Textile Mills, Apparel and Other Fabric Product Manufacturing; Leather and Leather Products; Printing and Publishing; Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries; Leather Tanning and Finishing; and Fabricated Metals Products.

The Oregon sector-specific requirements appear to come directly from the federal MSGP, and typically include industry best practices related to housekeeping, additional Stormwater Pollution Control Plan elements, Sector-Specific Benchmarks, and effluent limitations based on federal Effluent Limitation Guidelines. As a result, the new Oregon 1200-Z permit is 93 pages long as compared to the previous permit's 27 pages.

The Current Washington State Industrial Stormwater General Permit (ISGP) includes sector-specific benchmarks, but denies coverage for any part of a facility that has a stormwater discharge subject to stormwater Effluent Limitations Guidelines, New Source Performance Standards under 40 CFR Subchapter N, or Toxic Pollutant Effluent Standards under 40 CFR Subchapter D Part 129. These would include: 40 CFR 411 Cement manufacturing; 40 CFR 412 Feedlots; 40 CFR 418 Fertilizer manufacturing; 40 CFR 419 Petroleum refining; 40 CFR 422 Phosphate manufacturing; 40 CFR 423 Steam electric power generation; 40 CFR 434 Coal mining; 40 CFR 436 Mineral mining and processing; 40 CFR 440 Ore mining and dressing; 40 CFR 443 Paving and roofing materials (tars & asphalt); and Facilities discharging toxic pollutants, which are limited by effluent standards in 40 CFR Subchapter D Part 129 (including Aldrin/Dieldrin; DDT; Endrin; Toxaphene; Benzidine); or Polychlorinated Biphenyls (PCBs).

These facilities must apply for NPDES permit coverage in an individual or industry-specific general permit for those types of stormwater discharge.

Discharges to Water Quality Limited Waterbodies

Waterbodies that repeatedly fail to meet state water quality standards must be reported to the EPA under section 303(d) of the Clean Water Act (the 303(d) list). States must then develop Total Maximum Daily Loads (TMDLs) for discharges and management plans designed to restore the water body and meet the standard. In many states, including Oregon and Washington, there is a backlog of TMDLs awaiting development; not all 303(d) listed waters have TMDLs.

Washington's ISGP denies coverage for new dischargers to a 303(d) or TMDL water body unless the facility can document that it is not exposing stormwater to pollutants for which the water body is impaired, or can demonstrate that the discharge will meet water quality standards at the point of discharge, or there is a sufficient Waste Load Allocation in the TMDL to accommodate the discharge. The Washington ISGP also includes additional quarterly sampling requirements and effluent limits for discharges to 303(d) listed waters that do not yet have a TMDL. Washington Effluent Limits for 303(d) listed waters include: Turbidity; pH; fecal coliform bacteria; total suspended solids; total phosphorus; ammonia; copper; lead; mercury; zinc; and pentachlorophenol. Many of the parameters are assigned site-specific standards based on site-specific receiving water conditions (i.e., hardness).

Oregon has developed a separate general industrial stormwater permit specifically to address the TMDL developed for the heavily impacted Columbia Slough in Portland (1200-COLS) permit. This permit was renewed in the 2012-permit cycle and included the sector-specific requirements discussed above.

The Oregon 1200-Z permit assumes that existing dischargers to impaired waters with a TMDL are included in the general background allocation in the TMDL unless the TMDL establishes wasteload allocation(s) and additional requirements for industrial stormwater discharges. The Oregon Department of Environmental Quality (ODEQ) will inform the permit registrant if any additional limits or controls are necessary to be consistent with the assumptions of the Waste Load Allocation(s) in the TMDL(s), or if coverage under an individual permit is necessary. Existing dischargers to impaired waters that do not yet have a TMDL must "not cause or contribute to a violation of in-stream water quality standards" and must monitor for specific impairment pollutants and reference concentrations that will be provided by ODEQ at the time of assignment of permit coverage. These impairment pollutants will be based on the 2010 303(d) listing that was partially approved by EPA on March 15, 2012 (the Notice of Availability is in the Federal Register Vol. 77, No. 51, 15 March 2012).

The California Industrial General Permit requires dischargers operating facilities that discharge to 303(d) listed impaired waters to evaluate potential industrial pollutants that are related to the impaired

<div data-bbox="131 180 331 260">Stormwater Permits</div> <div data-bbox="164 300 298 367">Federal Approach</div> <div data-bbox="152 617 310 684">Monitoring Samples</div> <div data-bbox="139 896 324 963">Washington Action Levels</div> <div data-bbox="149 1035 315 1102">Operational BMPs</div> <div data-bbox="131 1176 332 1205">Source Control</div> <div data-bbox="118 1350 345 1379">Treatment BMPs</div> <div data-bbox="162 1453 302 1556">Oregon Corrective Actions</div> <div data-bbox="136 1770 326 1873">Benchmark Exceedance Requirements</div>	<p>receiving waters and to analyze for additional sampling parameters. The permit includes a list of the 303(d) impaired waters and TMDLs. Dischargers located within the watershed of a 303(d) impaired water body, for which a TMDL had been adopted by the Regional Water Board or EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule.</p> <p>The Federal MSGP includes a similar approach to discharges to water quality impaired waters. EPA will include additional limits and controls in permit coverage that reflect the conditions of the TMDL, when established. Additional monitoring and limits apply to existing dischargers when no TMDL has been established for an impaired water body. New dischargers to impaired waters have requirements to meet instream water quality criteria for the impairment pollutant at the point of discharge to the water body.</p> <p style="text-align: center;">Monitoring Frequency</p> <p>In Oregon and Washington, monitoring frequency has not changed under the new permits. In general, four samples must be collected (Oregon: twice before and twice after 1 January; Washington: quarterly) with some temporal sample event spacing requirements. Oregon opted to relax qualifying storm event and sampling methods to reduce barriers to obtaining samples to insure more monitoring data will be generated.</p> <p>For California, monitoring frequency increases from quarterly to twice quarterly when in Level 2 Corrective Action, and to every qualifying storm event when under Level 3 Corrective Action.</p> <p>The Federal MSGP requires quarterly monitoring for benchmarks, annual effluent limitation guidelines monitoring where applicable, and other state, tribal, and impaired water monitoring as required.</p> <p style="text-align: center;">Corrective Actions in Response to Monitoring</p> <p>Corrective actions in prior stormwater general permits generally required continuous improvement to operational and structural BMPs until benchmarks were consistently met. Newer permits are more prescriptive, requiring tiered levels of action that can lead to costly treatment.</p> <p>The Washington ISGP includes three levels of corrective actions in addition to the standard implementation of source control measures in the permit. Permittees that exceed any applicable benchmark value(s) must complete a Level 1 Corrective Action for each parameter exceeded that includes a review of the BMPS in the facility's Stormwater Pollution Prevention Plan, and implementation of additional operational source control BMPs. Operational Source Control BMPs mean schedules of activities, prohibition of practices, maintenance procedures, employee training, good housekeeping, and other managerial practices to prevent or reduce the pollution of waters of the state. Operational BMPs do not include construction of pollution control devices.</p> <p>Washington Permittees that exceed an applicable benchmark value (for a single parameter) for any two quarters during a calendar year must complete a Level 2 Corrective Action that includes implementation of additional structural source control measures. Structural Source Control BMPs are physical, structural, or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. Permittees that exceed an applicable benchmark value (for a single parameter) for any three quarters during a calendar year must complete a Level 3 Corrective Action. Level 3 Corrective Actions must implement Treatment BMPs that remove pollutants from discharges. Typically, treatment BMPs are energy, material, and labor intensive and therefore costly to construct and operate. Level 3 treatment BMPS must be designed and stamped by a licensed professional engineer, geologist, hydrogeologist, or Certified Professional in Storm Water Quality (CPSWQ).</p> <p>The Oregon permits have a similar (but two-tiered) corrective action response scheme. An individual benchmark or impairment failure must be investigated but Tier I Corrective Actions are less specific regarding whether responses are operational, structural, or treatment related. Following the second year of permit coverage, Oregon permittees must conduct a benchmark evaluation based on the geometric mean (pH has different criteria) of second year benchmark monitoring data. If the geometric mean of the sampling results for any outfall monitored exceeds any statewide benchmark, the permittee must implement Tier II Corrective Actions, which may include a combination of source control and treatment measures. A licensed Professional Engineer or Certified Engineering Geologist must design and stamp the Tier II corrective actions that address treatment measures. In Oregon, Tier I Corrective Actions apply to benchmarks and impairment pollutants, but Tier II Corrective Actions only apply to statewide benchmarks.</p> <p>Oregon's Tier II Corrective Actions include a provision that once professionally designed Tier II Corrective Actions are implemented, if sampling results continue to exceed the same benchmark parameter(s) that triggered the Tier II Corrective Action requirements, the permit registrant must evaluate whether the treatment measures were properly installed, maintained, and implemented, and whether modifications to these measures are necessary. However, additional treatment measures are not stipulated. This does not appear to be the case in Washington, where additional treatment measures must be implemented until benchmarks are met.</p>
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Stormwater Permits

California Corrective Actions

Corrective actions in the draft California Industrial General Permit involve three levels. Level 1 actions are triggered the first time sampling results fail to meet the following NAL criteria:

- The Daily Average (DA) for any one constituent exceeds the NAL value for two or more storm events of a reporting year
- The DA for any two constituents exceeds the NAL values for any single storm event within a reporting year
- The concentration for any one constituent exceeds 2.5 times the NAL value for any one individual or allowable combined sample (or is more than one pH unit outside the NAL pH range)

California Level 1 actions include evaluating areas where implementation of additional operational source control BMPs are necessary or demonstrating that they are not needed or sources are not related to facility industrial activities.

California Level 2 Corrective Actions are required if the NAL criteria are triggered for parameters already addressed in Level 1 actions in any subsequent year following the Level 1 actions. Under Level 2, discharges must select and implement additional structural and/or treatment source controls.

California Level 3 Corrective Actions are required when NAL criteria are triggered following Level 2 actions. Under Level 3, NALs become effluent limits in October of the following year. Failure to meet effluent limits can result in substantial fines and exposure to third party lawsuits as allowed in the Clean Water Act. This effectively imposes the need for costly end-of-pipe treatment to meet NELs.

The corrective actions in the federal MSGP include benchmark evaluations and other events not directly tied to benchmark evaluations. Improvements to site control measures must be evaluated and implemented if the average of four quarterly sampling results (or mathematical equivalent average if less sampling occurs) exceeds a benchmark. Other triggers include failing to meet numeric effluent limits and causation of failure to meet water quality standards, unauthorized discharges, and inspection results. Corrective actions are less prescriptive and include review and revision of the selection, design, installation, and implementation of control measures to ensure that the condition is eliminated and will not be repeated in the future.

Effluent Limits

Federal Requirements

Water Quality Standards

General Permits

WA/OR Approaches & Drawbacks

Benchmark-Driven Corrective Actions

WILL THEY ACTUALLY IMPROVE WATER QUALITY STANDARDS AND RESTORE BENEFICIAL USES?

While the benchmarks that trigger corrective actions are loosely tied to water quality standards there is no clear connection between failing to meet benchmarks and actual failure to meet in-stream water quality standards. As mentioned above, the nature of stormwater events, runoff conditions, and receiving waters are highly variable. The discharge conditions at each facility vary. Ideally, each facility would have an individual permit that includes site-specific conditions designed to assure that water quality standards are met. However, it is not practical to develop and implement individual permits for the half-million facilities the National Academies estimate require stormwater permit coverage. General permits are a reasonable compromise; by their very nature, though, they must be conservative and therefore err on the side of requiring costly treatment where in some cases, treatment will at best have no beneficial effect on water quality, and at worst, contribute to climate change, waste natural resources, and hinder economic development.

Oregon and Washington general permits attempt to strike a better balance by using risk-based Monte-Carlo simulations of discharge scenarios to assess the potential to cause water quality standard failures, rather than the traditional NPDES permitting approach for wastewater discharges that combine worst-case conditions upon worst-case conditions when setting effluent limits. Using real-world receiving and effluent data in probabilistic simulations is a better method; however, the Washington/Oregon approach attempts to combine too much state-wide data in general permits. Washington includes different copper benchmarks for eastern (32 µg/l) and western (14 µg/l) portions of the state in recognition of harness and other differences in receiving water on each side of the Cascades. Oregon ran simulations for east side/west side, and the Willamette basin conditions, but concluded the differences were too small to warrant the additional permit complexity.

The risk-based modeling Oregon did for the Columbia Slough permit demonstrates the difference in outcomes when aggregating model parameter data from large basins or geographic areas versus drilling into watershed or stream-specific data. As Table 3 (derived from the Oregon permit evaluation report) below shows, there are significant differences in the modeling results for Oregon-wide 1200-Z and Columbia slough specific 1200-COLS simulations.

Table 3. Comparison of 1200-Z and 1200-COLS Concentrations
Corresponding to a 10% Probability of Exceeding Water Quality Criteria

Stormwater Runoff (µg/l)	1200-Z	1200-COLS
Total Copper	6.0	45
Total Lead	43	210
Total Zinc	115	350

Stormwater Permits

Discharge Modeling

Tiered Permits

DEQ attributes the difference to higher hardness in the Columbia slough; however, the greater variation in other effluent and receiving parameters statistically must contribute to the difference. Moreover, both Oregon and Washington used fixed mixing rates (dilution of 5 in Oregon) throughout the simulations, which does not account for the great variation in stream flows to discharge rations that are known to occur during storm events.

During development of the Washington ISGP, a group of affected industries sponsored independent probabilistic stormwater discharge modeling to assess the potential for industrial sites to actually cause water quality standard impairment. Your author was involved in developing the model, the results of which were provided to Washington Department of Ecology and reported at and in the proceedings from StormCon 2011 conference (Higgins and Bryden 2011). This proof-of-concept alternate model used localized storm event data, stream specific data, and site-specific information on size industry type, and BMPs to simulate discharges. In addition, the model looked for and accounted for variables that correlate. For example, background hardness and receiving water metals concentrations tend to go down as stream flow goes up and mixing dilutions increase as receiving flows increase. Some results of the model exercise could have been predicted intuitively: smaller sites that discharge to large waterbodies would infrequently actually cause failures (in this case for zinc, less than one percent of the simulations) to meet in-stream water quality standards at the edge of a mixing zone even when benchmarks were not met (36 percent of the simulations) (Figure 1).

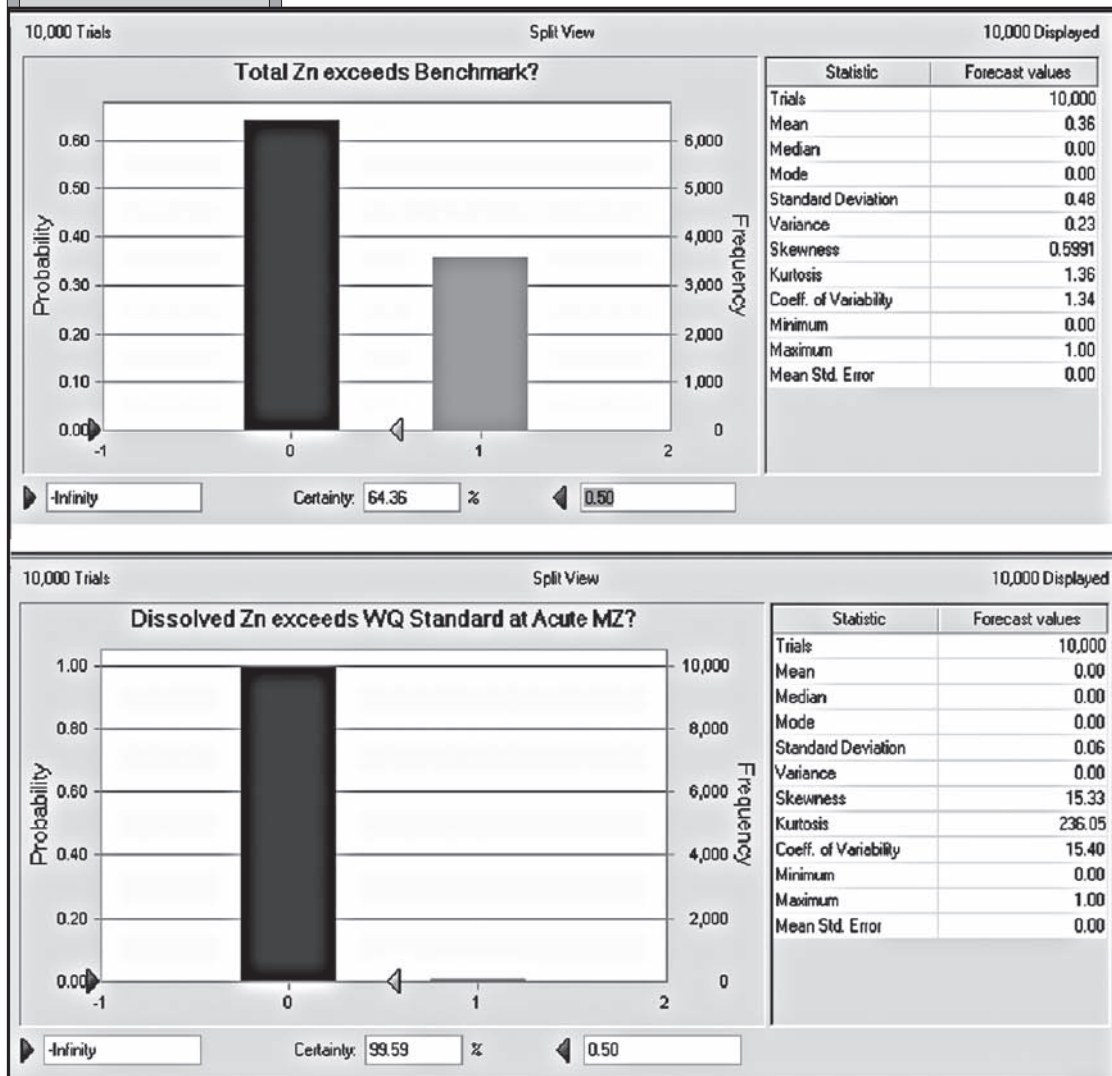


Figure 1. Likelihood that a composite Washington State Industrial Stormwater permittee will meet 2010 benchmark levels (top) and water quality criteria (bottom). The black bars represent percentage of time that the discharge met the benchmark level or the water quality criteria and the grey bars represent the percentage of time that the discharge did not meet water quality criteria.

While this model is preliminary and is only as good as the datasets it uses, it does demonstrate the need to look at benchmarks differently and to not assume failing to meet benchmarks is a direct indicator of water quality conditions.

The study suggests that modeling could be used to identify sites with higher probability of causing water quality violations, focusing permitting and controls where the efforts will actually make a difference. Perhaps, instead of a one-size fits all general permit, states could use screening tools to fit dischargers into tiered permits depending on the risk they present.

To be fair, general permits have included greater flexibility such as applying specific requirements for industry sectors, rather than forcing all industries to meet the most stringent standards developed for industries with the greatest potential to pollute. A similar approach is needed to address the differences in where dischargers are located and the receiving water conditions of their discharge.

Stormwater Permits

Flow & Loading

"AKART"

Load Reductions

MS4 Flexibility

MS4 General Requirements

Flow Control

UIC Devices

Streambed Integrity

Harvesting & Reuse

Industrial Permits and Flow Quantity Controls

The newer stormwater permits in western states aggressively focus on water quality standards, but water quality is only half the equation when it comes to protecting beneficial uses. As the National Academies review points out, flow and loading are more critical than concentration.

The Washington ISGP does require Stormwater Peak Runoff Rate and Volume Control BMPs for facilities with new development or redevelopment. New or redeveloped facilities must evaluate whether flow control BMPs are necessary to satisfy the state's AKART (i.e. "all known, available, and reasonable methods of prevention, control, and treatment") requirements, and prevent violations of water quality standards. AKART, as defined by the Washington State Department of Ecology, means the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. The concept of AKART applies to both point and nonpoint sources of water pollution. The term "best management practices," typically applied to nonpoint source pollution controls is considered a subset of the AKART requirement.

Oregon's new permit allows for load reductions to be considered in Tier II corrective actions through Low Impact Development if the reductions result in reduction of mass load of pollutants below the mass equivalent of the benchmarks. However, it is not clear how this can be demonstrated.

Development standards and stormwater management practices in MS4 permits also affect industrial discharges in communities large enough to be subject to MS4 permitting.

The Role of MS4 and Other Permits in Regulating Industrial Stormwater

MS4 permits have greater flexibility in stormwater management approaches, mostly in recognition of the difficulty of managing stormwater on a much large scale, and perhaps in part because the CWA amendments for municipal stormwater did not put as much emphasis on discharge monitoring and controls.

Some states have one general Phase I and II MS4 permit that is applied statewide. Oregon provides separate MS4 permits to each Phase I and II community. Phase I MS4s for three of the four larger communities have been recently re-issued.

While individual state and community permits vary, MS4 permits contain similar general requirements including identification and correction of non-stormwater discharges to storm sewer systems, controlling stormwater pollution to the maximum extent practicable, and implementing community stormwater management plans. MS4 permittees must also screen and regulate industrial and commercial facilities and construction sites that discharge to the MS4. MS4 permits include public outreach programs to help educate citizens of their role in creating and controlling pollutant runoff. Most MS4 permits require community development standards to address flow control. For example, the recently issued Clackamas County (Oregon) MS4 permit specifically requires that new development and redevelopment projects be designed to capture and treat a minimum of 80% of the annual average runoff.

Some communities have relied heavily on drywells and other underground injection control (UIC) devices to manage stormwater on site. While underground injection can help recharge aquifers and cool discharges, care must be taken to ensure we have not simply moved pollutants from surface water to groundwater. UICs, including stormwater (Class V UICs) are regulated under the Safe Drinking Water Act. Stormwater UICs are subject to permitting. Where there is potential direct communication with groundwater, UICs may be prohibited or require pretreatment to meet drinking water standards. Just as detention and infiltration ponds do, UICs also may have a detrimental impact on watershed hydrology.

Hydromodification

Many recent MS4 permits attempt to address issues of modification of hydraulic regimes of surface water systems (hydromodification). Over the last decade, studies of stream channel function and quality have found that, in addition to large sudden high flow runoff events, prolonged lower-rate discharges can also have a detrimental impact on streambed integrity. In addition, changing the flow regimes of ephemeral streams through groundwater recharge can change the habitat configuration of the stream and potentially impact rare or endangered species that have adapted to intermittent or seasonal flows.

Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California (SCCWRPA 2005) provides a good summary of hydromodification studies in the west. These studies led to the conclusion that traditional approaches to detention and release or infiltration of stormwater are not sufficient to protect watershed health. New approaches that match pre-development hydrology, including evapotranspiration losses of stormwater, are needed. Vegetated green roofs may help, but there are many other impervious areas associated with development that cannot easily be replaced. Stormwater harvesting and reuse may be a tool which helps make up for loss of vegetation that once held and transpired stormwater in a watershed.

**Stormwater
Permits****Erosion Control****Numeric
Effluent Limits****Pesticide
Issues****Ecological
Services Trading****Construction Stormwater**

Other stormwater related permits attempt to address specific concerns identified through increased understanding of the sources of stormwater pollutants and may indirectly affect industrial facilities during development and upkeep. Construction Stormwater Permits, which focus on river-clogging eroded sediment and pollutants carried with suspended solids, now apply to construction sites where one acre or more are disturbed. This was phased in from five acres over time under the CWA. EPA has established Effluent Limit Guidelines for turbidity of 280 nephelometric turbidity units (NTUs) that currently apply to sites 20 acres or larger and will apply to sites 10 acres or more beginning February 2, 2014. In addition, on February 16, 2012, EPA issued the final 2012 Construction General Permit that mostly relies on best erosion control practices.

This has led to numeric effluent limits in some state construction stormwater permits. The Washington Construction General Stormwater Permit has numeric limits of 50 NTUs or 10% above background if background is higher, and pH limits of 6.5 to 8.6 units. Oregon's current 1200-C construction stormwater permit requires control measures and has visual monitoring for turbidity, but does not include effluent limits for turbidity or pH. California's construction stormwater permit is being contested, but it includes NELs for pH and turbidity depending on site-specific risk factors.

Pesticide General Permit and Stormwater

In anticipation of the federal Pesticide General Permit and on-going litigation over whether pesticide discharges require an NPDES permit, many states developed and issued general pesticide permits. These permits are generally based on the federal permit (which became effective October 31, 2011, as were many of the state permits) and focus on direct point source discharges of aquatic pesticides and aerial applications over water (forest canopy) over large areas. However, some permits include undefined references to discharges at water's edge, and any application that leaves a residue that could pull in terrestrial applications and stormwater runoff from terrestrial applications. In addition, many of the state permits restrict any discharge of a pesticide to waterbodies that are listed for the pesticide and specially protected (e.g., outstanding natural resource waters). This will require careful understanding of which waterbodies are restricted and how pesticides move in the environment.

CONCLUSION**NEXT STEPS TO MANAGING QUANTITY AND QUALITY**

As our understanding of the science of water quality increases, it is apparent that traditional effluent limit based approaches are not going to address all the issues needed to protect beneficial uses of our surface waters. Other approaches, including Low Impact Development, implemented through MS4s and the resultant management plans and policies can help bridge the gap. However, there needs to be greater flexibility and more efficient uses of limited resources to bring our watersheds back to their full potential. One possible tool to achieving watershed health is Ecological Services Trading, which provides an opportunity for stormwater permit holders to pool resources and effect projects beyond the facility fence line, where greater benefits can be realized beyond the narrow focus of water quality. Developing watershed level permitting and coordinated trading mechanisms — that provide water quality and quantity management, as well as climate, habitat, and aesthetic services, and the checks and balances needed to make them work — are admittedly arduous tasks. The alternative, however, is to continue on the current path industrial permits are leading us toward: an uncoordinated patchwork of individual onsite technology-based and energy-intensive treatment systems that may not provide the watershed health protection envisioned in the Clean Water Act.

FOR ADDITIONAL INFORMATION:

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See websites for permits and article references — next page.

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Stormwater Permits: Additional Information

Links to Stormwater Permits

Federal MSGP: www.epa.gov/npdes/pubs/msgp2008_finalpermit.pdf

Federal CSP: www.epa.gov/npdes/pubs/cgp2012_finalpermit.pdf

Washington ISGP: www.ecy.wa.gov/programs/wq/stormwater/industrial/permitdocs/iswgpfinal102109.pdf

Oregon 1200-Z: www.deq.state.or.us/wq/stormwater/docs/pnc1200Zmod.pdf

Oregon 1200-COLS: www.deq.state.or.us/wq/stormwater/docs/pnc1200COLSmod.pdf

Draft California Industrial General Permit: www.swrcb.ca.gov/water_issues/programs/stormwater/docs/industrial/p_igp_jan.pdf

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WATER BRIEFS

OREGON TEMPERATURE WATER QUALITY STANDARDS UPHELD (SORT OF)

by Rick Glick, Davis Wright Tremaine (Portland, OR)

In a 51-page opinion issued February 28, Federal Magistrate Judge Acosta handed EPA and the Oregon Department of Environmental Quality (DEQ) a partial victory in *Northwest Environmental Advocates v. EPA et al.*, Case No. 3:05-cv-01876-AC (D. Or. Feb. 28, 2012). The decision upheld EPA's approval under the Clean Water Act of Oregon numeric temperature water quality standards, while rejecting certain narrative standards. Northwest Environmental Advocates (NWEA) also challenged the biological opinions issued by the National Marine Fisheries Service and US Fish and Wildlife Service under the Endangered Species Act. The Services concluded that the Oregon temperature and intergravel dissolved oxygen standards would not jeopardize listed salmonid species, and those agencies did not fare as well in the case.

Oregon's temperature standards were adopted in 1996 and promptly attacked. In 2003, EPA Region 10 adopted its Temperature Guidance, and Oregon's temperature standards were reformulated. NWEA again found the revised standards wanting and brought the case at issue. The judge upheld DEQ's numeric temperature standards, despite evidence that the standards were less than optimal for fish, deferring to the scientific expertise of the government.

The judge found fault, however, with narrative standards that deal with "nonpoint sources" of heat. A point source is a discrete, end-of-pipe discharge to a waterway, whereas nonpoint sources are diffuse, such as runoff from a field. The Clean Water Act regulates point sources through a permit program, while nonpoint source control is mostly aspirational. The Oregon narrative standards for nonpoint sources say that if a nonpoint source adopts "best management practices" then they are deemed to be in compliance.

The court found that this formulation undermines the numeric standards as it provides a substitute for actual compliance. The same reasoning was applied to the so-called Natural Conditions Criteria, which provide that compliance is excused if natural conditions exceed standards. The court found that such an exemption supplants otherwise lawful standards.

The court's objections to the narrative standards notwithstanding, neither the Clean Water Act nor state law authorize direct regulation of nonpoint sources. The narrative standards were Oregon's attempt to address them without adopting a new regulatory program. It seems the court reacted to the blanket exemptions provided in the rules, and it further seems that Oregon can revise them and pass muster. The deference shown the agencies on the science suggests that the court will allow some leeway on language used to deal with nonpoint sources and the effects of natural conditions.

No such deference was granted to the federal fisheries services. On remand, they will have to prepare a new biological opinion that accounts for Evolutionary Significant Units (i.e. sub-groups of salmonids), potential for recovery, baseline conditions, and cumulative effects. Further, the US Fish and Wildlife Service (FWS) was chastised for considering factors other than the best scientific data available in formulating its opinion. That is, FWS seemingly bowed to pressure to support the EPA Temperature Guidance, even though it believed that temperatures for bull trout provided for in the Guidance were not what the Service considered to be optimal.

The net result of the many years of litigation over Oregon's temperature standards is that Oregon's approach, and EPA's approval under the Clean Water Act, were largely validated. Problems with narrative standards should be correctable. Whether on reanalysis the Services find that the standards are protective of listed species, as required under the Endangered Species Act, remains to be seen.

For info: Judge Acosta's Opinion and Order is available at: <http://law.lclark.edu/live/files/10726-wqs-temperature-opinion>

WATER BRIEFS

SECRET SOCIETY

CA

SHADOW GOVERNMENT ALLEGED

On April 4, the San Diego County Water Authority (Water Authority) sued the Los Angeles Department of Water & Power (LADWP) in Los Angeles Superior Court for failing to release public documents as required by the California Public Records Act. *San Diego County Water Authority v. City of Los Angeles Department of Water and Power*, Case No. BS136663 (April 4, 2012) (“Petition”). “The Water Authority tried unsuccessfully for five months to obtain public documents that should have been made available in days,” said Kelly A. Aviles, one of the attorneys representing the Water Authority. On October 28, 2011, the Water Authority sent Public Records Act requests to the Metropolitan Water District of Southern California (MWD) and several of its member agencies, including LADWP. The Water Authority stated in a press release that it wanted to learn more about the meetings of a group of MWD member agency managers believed to be meeting secretly and coordinating votes of the MWD board of directors. “LADWP has stonewalled all efforts to obtain public records leaving the Water Authority no choice but to go to court,” Aviles said. The Water Authority is one of the 26 member agencies of MWD.

The lawsuit alleges that the records produced by other public agencies “paint a startling portrait of a shadow government with its hands on virtually every major important policy decision to be presented to the MWD Board, including the setting of MWD’s water rates and charges. Those documents also confirm that employees of LADWP played an especially active role in this MWD Member Agency Managers Working Group, the formal name for the Secret Society. LADWP frequently communicated with other members of the Secret Society and its paid consultants about the group’s activities.” Petition at 3. The records produced by other agencies also show that LADWP spent water ratepayer money to pay consultants and fund a clandestine economic study of the Water Authority’s water rates and water transfer agreement with the Imperial Irrigation District, according to the Water Authority.

Among other allegations in the lawsuit, the Water Authority pled

that “a number of MWD members agencies had...formed a new group, which some of the participants have referred to as ‘the Secret Society’ and the ‘anti-San Diego Coalition,’ to secretly meet and discuss issues that would be coming before the MWD Board.” The lawsuit goes on to allege that the Water Authority “suspected that this clandestine group was secretly coordinating votes of the MWD Board and improperly controlling MWD decisions in order to ensure financial benefits for the group’s members at the expense of the non-participating member agencies, including SDCWA.” *Id.* at 2-3. The Petition also alleges that a “secure web link” was created “to use when conducting business relating to the ‘Secret Society’ in an attempt to conceal documents from disclosure.” *Id.* at 14.

For info: Lawsuit documents (Petition) available at: www.sdcwa.org/sites/default/files/files/petition-for-writ-of-mandate-with-exhibits-2012-0404.pdf; Documents received from the other MWD member agencies at: www.mwdfacts.com

SKI AREA WATER

US

FOREST SERVICE TAKING?

A lawsuit has been filed that has huge implications for any water user with an associated Forest Service permit. On January 9, a lawsuit was filed in federal court in Colorado by the National Ski Areas Association (Ski Areas) to invalidate “Clause D-30” that the US Forest Service (Forest Service) has inserted into leases that Ski Areas operate under on Forest Service lands. *National Ski Areas Association, Inc. v. U.S. Forest Service, et al.*, Case 1:12-cv-00048-JLK (Jan. 9, 2012). The lawsuit was brought under the Administrative Procedures Act (APA) for judicial review of the final agency action. Three ski areas have already been required to accept the clause (effective November 8, 2011) as a term in their special use permits in order to operate: Powderhorn in Colorado, Alpine Meadows in California, and Stevens Pass in Washington.

The lawsuit alleges that the Forest Service’s action is a “stunning and unprecedented directive to its employees that they insert new conditions into ski area permits to control and seize privately owned water rights acquired

and used under state law by ski area operators at ski areas on National Forest System lands throughout the United States.” The Complaint maintains that the clause is “arbitrary, capricious, in excess of the Forest Service’s statutory authority, compels an uncompensated taking of private property, and was adopted without public notice or an opportunity to comment as required by the APA and by the National Forest Management Act (“NFMA”).” Complaint at 2.

The key provision of Clause D-30 is that it “prohibits ski area operators from selling water rights used at the ski area to anyone except the future ski area operator, even water rights that the ski area obtains from private lands or lands miles away from the ski area;” (*Id.* at 3). This provision would clearly limit the use of the water rights solely to the ski area involved and would not allow any sale or transfer of the water rights. The lawsuit also alleges that the provision “requires ski area permit holders to waive any legal claim for compensation against the United States for privately owned water rights seized, taken, and subject to compelled transfer under the 2011 Directive;” (*Id.*)

The lawsuit pits the authority and powers of the Forest Service against the private property rights of the Ski Areas. The Complaint asserts that the “Forest Service purported to authorize itself to take the actions required by the 2011 Directive. No legislation authorizes the Forest Service to use its ski area special use permit authority to exercise dominion and control over water rights arising under state law. No statute authorizes the Forest Service to condition the issuance of a ski area special use permit on the permit holder assigning its water rights to the Forest Service. No statute authorizes the Forest Service to prohibit a ski area permit holder from transferring its water rights obtained under state law to anyone except the successor permit holder...No statute authorizes the Forest Service to condition the issuance of a ski area special use permit on the permit holder waiving its claim that the permit conditions amount to a taking without compensation in violation of the Fifth Amendment to the United States Constitution.” *Id.* at 4.

The Ski Areas filed an amended complaint on March 12, adding a claim

WATER BRIEFS

that the Forest Service neglected to consider economic impacts on small businesses and thereby violated the Regulatory Flexibility Act. The Forest Service filed its answer on March 26. The Complaint, Amended Complaint and Forest Service Answer are available in full at the link below.

For info: Court Documents at: www.martenlaw.com/sites/default/files/pdfs/Nat-Ski-Areas-Assn-Suit-v-Forest-Service.pdf

LAS VEGAS WATER NV/UT GROUNDWATER EXPORTATION

On March 22, Nevada's State Engineer Jason King released rulings for the Southern Nevada Water Authority's (SNWA's) proposed pipeline project from eastern Nevada. Four rulings were issued — one each for Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley. The rulings could allow the pumping of up to 83,988 acre-feet (AF) of water to SNWA, which applied for 125,976 AF in its original applications for water rights in the four valleys. SNWA's most recent request asked for 104,856 AF of water. This is the second time the State Engineer has issued rulings on these applications, previously ruling on the Spring Valley applications in 2007 and for Cave, Dry Lake and Delamar Valleys in 2009. The applications were ordered to be reheard as a result of a 2010 Nevada Supreme Court decision.

Four applications were denied in Spring Valley due to potential impacts to existing water rights. State Engineer King found that the approval of the remaining applications as outlined in the rulings will not conflict with existing rights or protectable interests in domestic wells, will not prove detrimental to the public interest, and will be environmentally sound. King further found that SNWA justified the need for the water, has a plan for water conservation in place that is being effectively carried out, and, by appropriating the amounts set out in the ruling will not limit the future growth and development of the basins of export.

The total amount ultimately permitted for use is dependent upon "staged pumping" in Spring Valley. In addition to staged pumping, other safeguards include two-years of biological and hydrological data collection (as approved by the State

Engineer, prior to exportation); a groundwater flow model (updated as directed by the State Engineer to help predict impacts at least every five years); and a monitoring, mitigation and management program for each basin prior to any export of water. Should there be any unanticipated impacts to existing water rights, conflicts with existing domestic wells, or the pumping threatens to prove detrimental to the public interest — or is found not to be environmentally sound — SNWA shall be required to take any and all measures, including the curtailment of pumping, to mitigate the impacts.

For Spring Valley, fifteen applications were granted for a total duty (volume) of 61,127 AF (annually) to be developed in a staged approach. The "staged pumping" for the Spring Valley rights consists of Stage 1 with a development of 38,000 AF over eight years; Stage 2 development of an additional 12,000 AF over eight years may be granted depending on Stage 1 pumping; and Stage 3 development of the entire amount, which may be granted depending on Stage 2 pumping. The State Engineer also reserved 4,000 AF for future growth and development in Spring Valley.

Cave Valley rights were granted for a total duty of 5,235 AF annually; Dry Lake Valley rights were granted for a total duty of 11,584 AF annually; and Delamar Valley rights were granted for a total duty of 6,042 acre-feet annually. These water rights have similar conditions regarding data collection, monitoring and mitigation, and groundwater flow modeling as the Spring Valley rights. The State Engineer elected to reserve 50 AF annually each in Cave Valley, Dry Lake Valley and Delamar Valleys for unforeseeable future growth.

For info: State Engineers' Rulings at: water.nv.gov

SUPPLY/DEMAND WEST COLORADO RIVER BASIN OPTIONS

The Colorado River Basin Water Supply & Demand Study (Study) has announced that the options received to help resolve future water supply and demand imbalances in the Basin have been posted to the Study's website. In November 2011, the Study began its fourth and final phase: Development of Opportunities to Balance Supply and

Demand. From November 2011 through February 2012, public input was sought for ideas on a broad range of potential options to help resolve projected water supply and demand imbalances in the Basin. During this period, over 140 ideas were submitted, representing a broad range of possibilities.

Work is on-going in the Study to evaluate the effectiveness of these options in addressing imbalances between the supplies and demands characterized in the Study. The Study will not result in the selection or funding of a particular proposed option or set of options. Rather, the Study will explore a broad range of options to help address future imbalances and the performance of those options across a range of future conditions.

The Water Report is planning a major article by Carly Jerla of the US Bureau of Reclamation soon that will address the demand scenarios in the Study and options to help resolve future water supply and demand imbalances (see also Jerla, *TWR* #90).

For info: Pam Adams, Reclamation, 702/ 293-8500 or ColoradoRiverBasinStudy@usbr.gov; options and additional Study materials at: www.usbr.gov/lc/region/programs/crbstudy/imbalanceoptions.html

SAN JOAQUIN EFFORTS CA RECAPTURED INTERIM FLOWS

The Bureau of Reclamation (Reclamation) has released the Final Environmental Assessment and Finding of No Significant Impact (EA/FONSI) for the Recirculation of Recaptured Water Year (WY) 2012 San Joaquin River Restoration Program (SJRRP) Interim Flows. Reclamation estimates that 20,000 to 80,000 acre-feet (AF) of recaptured Interim Flows (based on 90- and 50-percent exceedance levels) could be made available for recirculation back to Central Valley Project (CVP) Friant Division contractors as Class 1 or Class 2 supplies during WY 2012. (Class 2 is additional water, when available, beyond the firm amount of 800,000 AF of Class 1 water.) The EA evaluates a maximum possible amount of up to 260,000 AF. This recaptured water will be available at South-of-Delta facilities for direct delivery to the Friant Division or through transfers and exchanges between Friant contractors and non-Friant contractors.

WATER BRIEFS

The federal action would involve Reclamation entering into various delivery, transfer, or exchange agreements to recirculate the recaptured water to the Friant and non-Friant contractors. The deliveries, transfers, and exchanges would be completed through several potential mechanisms utilizing federal, state and local facilities. Friant contractors may transfer or exchange their water to other Friant or non-Friant contractors, not in excess of the existing non-Friant contractors' CVP contract allocations.

The 2006 Stipulation of Settlement in *NRDC, et al., v. Rodgers, et al.*, provides for the development of a recapture and recirculation plan as a part of the implementation of the SJRRP water management goal. The goal is to reduce or avoid adverse water supply impacts to all of the Friant Division long-term contractors that may result from the Interim Flows.

For info: Margaret Gidding, Reclamation, 916/ 978-5461 or mgidding@usbr.gov; Final EA/FONSI available at: www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=9063; More info about the SJRRP at: www.restorejsr.net

UTILITIES STRATEGIES US

CLIMATE ADAPTATION GUIDE

The Adaptation Strategies Guide for Water Utilities is now available from EPA. The guide was developed under EPA's Climate Ready Water Utilities initiative to assist drinking water and wastewater utilities in gaining a better understanding of what climate change-related impacts they may face in their region and what adaptation strategies can be used to prepare their system for those impacts. The guide contains easy-to-understand climate science and information, utility adaptation case studies, as well as an adaptation planning worksheet.

Information in the guide will help jump start the adaptation planning process at water and wastewater utilities that may not have started to consider climate change impacts or adaptation. It can also be used by any group or organization that is interested in water sector climate challenges.

For info: Guide at: <http://water.epa.gov/infrastructure/watersecurity/climate/>; Questions or feedback: CRWUhelp@epa.gov

FRACKING INVESTIGATED US

EPA STUDY CONTINUING

Following discussions, Wyoming Governor Matthew Mead, the Northern Arapaho and Eastern Shoshone Tribes (Tribes), and EPA Administrator Lisa Jackson issued a statement on March 8 about groundwater issues in the area east of Pavillion, Wyoming and possible contamination by area fracking operations. The statement notes that "collaboration and use of the best available science are critical in meeting the needs of Pavillion area residents and resolving longstanding issues surrounding the safety of drinking water and groundwater." The parties agreed that EPA "will work with the State, the Tribes and the rural community east of Pavillion to find the long-term and affordable drinking water solution."

In order to reach that solution, the three parties have agreed that "further sampling of the deep monitoring wells drilled for the Agency's groundwater study is important to clarify questions about the initial monitoring results. The EPA will partner with the State and the United States Geological Survey (USGS), in collaboration with the Tribes, to complete this sampling as soon as possible and will collaborate with the State and other stakeholders in designing the sampling methodology, the quality assurance plan, and other features of the next phase of testing." EPA has agreed to delay convening the peer review panel on the draft Pavillion report until a report containing the USGS data is publicly available.

The Tribes, EPA and Wyoming agreed to convene a group of stakeholders and experts to develop and carry out a plan for further investigation of the Pavillion gas field to identify potential risks to drinking water, including possible sources and pathways for the migration of contaminants. Additional research will be conducted collaboratively using the highest scientific standards and will be subjected to independent peer review, according to the Statement.

For info: Richard Mylott, EPA, 303/ 312-6654; Renny MacKay, Wyoming, 307/ 777-7437; Eastern Shoshone Business Council, 307/ 332-3532; Northern Arapaho Business Council, 307/ 332-6120; EPA's website: www.epa.gov/region8/superfund/wy/pavillion/index.html#1

ADJUDICATION REMOVED OK

STATE SUIT MOVED TO FED COURT

Just when it seemed Oklahoma's controversy over water in Sardis Lake couldn't become more convoluted, it did. On March 12, the US Justice Department (DOJ) filed a Notice of Removal to the United States federal district court of the general stream adjudication lawsuit that the State of Oklahoma had begun to adjudicate water rights in the Kiamichi, Muddy Boggy and Clear Boggy Basin stream systems (*Oklahoma Water Resources Board v. United States of America, et al.*, Case No. 110375).

The DOJ's Notice states its position regarding removal of the general stream adjudication as follows: "The Board's [Oklahoma Water Resources Board] Petition and Brief do not reveal any reason for initiating a general stream adjudication of the Kiamichi, Muddy Boggy and Clear Boggy basins (such as a water shortage) apart from the Board's desire to resolve the Nations' federal law-based claims, and thus suggest that the state-law legal questions and associated factual questions typically presented in a general stream adjudication could be avoided by resolution of the Nations' claims presented in its action in this Court. Removal will facilitate resolution of the common federal questions underlying both actions, thereby conserving judicial resources." Notice at 3.

Meanwhile, on March 27th, a federal judge ordered a 60-day stay of court proceedings between the parties to benefit a mediation process the parties are engaged in with a Court-appointed mediator.

For info: Notice of Removal available at: www.orwp.net/wp-content/uploads/2012/03/20120312-Notice-of-Removalx.pdf

IRRIGATION WATER WEST

ESA IMPACT ON FED LANDS

On February 27, in response to a settlement of litigation by the Western Watersheds Project, the National Marine Fisheries Service issued a Biological Opinion (BO) that finds that irrigation diversions on 12 Lemhi River tributaries on Forest Service administered land jeopardize the survival of steelhead and Chinook salmon. The BO also directs that Reasonable and Prudent Measures be adopted that will ensure a minimum

WATER BRIEFS

stream flow in the tributaries during the irrigation season as well as require new headgate structures with fish screens.

According to Western Watershed Project, the Biological Opinion is unprecedented in that it requires the Forest Service to administer irrigation diversions on public lands to benefit the recovery of Endangered Species Act listed steelhead and Chinook salmon.

For info: Biological Opinion & attachments at: https://pcts.nmfs.noaa.gov/pls/pcts-pub/pcts_upload.summary_list_biop?p_id=22528; Jon Marvel, Western Watersheds Project, 208/788-2290 or www.westernwatersheds.org

NEPA PROCEDURE

AZ

MERITS & CLAIM PRECLUSION

Another round of litigation involving snow-making proposed by Arizona Snowbowl and opposed by various tribal entities and environmental groups based on tribal religious and cultural grounds plus environmental concerns has wound its way to a conclusion following seven years of procedural arguments. *Save the Peaks Coalition v. U.S. Forest Service*, Case No. 10-17896, ___ F.3d ___, 2012 WL 400442 (9th Cir. Feb. 9, 2012). Referring to the case as a “gross abuse of the judicial process” the 9th Circuit ruled that the plaintiffs’ claims were meritless under the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq., and the Administrative Procedure Act (APA), 5 U.S.C. §§ 701-706.

Legal practitioners interested in the concept of “laches” may want to review the details of the case.

For info: Case available at: www.ca9.uscourts.gov/datastore/opinions/2012/02/09/10-17896.pdf

HEALTHY WATERSHEDS

US

EPA PROTECTION GUIDANCE

EPA recently released a new technical document titled “*Identifying and Protecting Healthy Watersheds: Concepts, Assessments, and Management Approaches*.” This document provides state water quality

and aquatic resource scientists and managers with an overview of the key concepts behind the Healthy Watersheds Initiative. The initiative is intended to preserve and maintain natural ecosystems by protecting our remaining healthy watersheds, preventing them from becoming impaired, and accelerating restoration successes. The initiative encourages states to take a strategic, systems approach to protecting healthy watersheds and preventing future water quality impairments.

This document provides examples of approaches for assessing components of healthy watersheds, integrated assessment options for identifying healthy watersheds, examples of management approaches, and assessment tools and sources of data.

For info: The document is available at <http://water.epa.gov/polwaste/nps/watershed/index.cfm>.

BASIN STUDIES

WEST

WATERSMART FUNDING

On March 21st, Secretary of the Interior Ken Salazar announced that Interior’s Bureau of Reclamation is providing \$2.4 million in funding for comprehensive water studies in California, Colorado, Kansas, Nebraska, New Mexico, and Oklahoma.

The funding comes through the Department of the Interior’s WaterSMART Basin Study Program. This program provides leadership and tools to states and local communities to address current or projected imbalances between water supply and demand and to work toward sustainable solutions. In addition to the federal funding, \$3.9 million will be provided by non-federal partners for a total of more than \$6.3 million.

The selected projects are the Los Angeles Basin in California; the Pecos River Basin in New Mexico; the Republican River Basin in Colorado, Kansas and Nebraska; the Sacramento-San Joaquin River Basins in California, and the Upper Washita River Basin in Oklahoma.

Specifically, the Los Angeles Basin and Sacramento-San Joaquin Basin have projects within their boundaries that

were identified in the America’s Great Outdoors 50-State Report released in November 2011.

Basin studies are comprehensive water studies that define options for meeting future water demands in river basins in the western United States where imbalances in water supply and demand exist or are projected to exist. Each study consists of four key segments:

- State-of-the-art projections of future supply and demand in the river basin;
- An analysis of how the basin’s existing water and power operations and infrastructure will perform in the face of changing water realities;
- Development of options to improve operations and infrastructure to supply adequate water in the future; and
- Analysis of the options identified to arrive at findings and recommendations about how to optimize operations and infrastructure in a basin to supply adequate water in the future.

The non-federal partners in a basin study must contribute at least 50 percent of the total study cost in non-federal funding or in-kind services. Basin studies are not financial assistance and Reclamation’s share of the study costs may be used only to support work done by Reclamation or its contractors. Non-federal partners include state and city agencies, municipal water districts, flood control districts, foundations, conservation groups, and civic organizations.

The WaterSMART Program addresses increasing water supply challenges, including chronic water shortages due to population growth, climate variability and change, and growing competition for finite water supplies. Through the basin studies program, Reclamation will work cooperatively with state and local partners in the 17 western states to evaluate future water supply and demand imbalances, assess the risks and impacts of climate change on water resources, and develop potential mitigation and adaptation strategies to meet future demands.

For info: www.usbr.gov/WaterSMART/bsp or www.usbr.gov/WaterSMART/

The Water Report

CALENDAR

April 16-18 **DC**
National Hydropower Ass'n Annual Conference, Washington. Capital Hilton. For info: www.nationalhydroconference.com/index.html

April 17 **UT**
Water Environment Ass'n of Utah 2012 Annual Conference, St. George. Dixie Ctr. For info: www.weau.org/conferences/2012-annual-conference

April 18 **OR**
Managed Aquifer Recharge & Urban Stormwater Harvesting Lecture, Corvallis. OSU - ALS 4000, 4-5pm. Sponsored by Institute for Water & Watersheds. For info: <http://water.oregonstate.edu/sponsored-events>

April 18 **MT**
Water Rights: A Current & Future Look Workshop, Livingston. Sponsored by Montana Watercourse & Park Co. Conservation Dist. For info: <http://mtwatercourse.org/events/page.php?eventID=61>

April 18 **WA**
UW Water Symposium, Seattle. NHS Hall, University of Washington. Hosted by Center for Urban Waters. For info: www.urbanwaters.org/

April 18 **WA**
NWS-AWWA Water Resources Committee Lunch-n-Learn, Vancouver. City of Vancouver Water Resources Education Center, 4600 SE Columbia Way, 11:30am-1:30pm. For info: RSVP to Judi Ranton, 503/ 823-7513 or Judi.Ranton@portlandoregon.gov

April 18 **CA**
NEPA Overview & Refresher Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

April 18-20 **MT**
Riparian Restoration in a Contaminated Environment Symposium, Deer Lodge. Elk's Lodge. Sponsored by Montana Natural Resource Damage Program. For info: www.doj.mt.gov/lands/symposium.asp

April 19 **AZ**
Valuing the Multi-Benefits of the Murray-Darling Basin Plan (Brownbag), Tucson. WRRRC, 350 N. Campbell Ave., 12-1:30pm. For info: Jane Cripps, Water Resources Research Center, 520/ 621-2526, jcripps@cals.arizona.edu or cals.arizona.edu/azwater

April 19 **WA**
Water Right Transfers Seminar, Seattle. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 19 **AK**
Regulation of Water in Alaska Seminar: The Changing Environment of Permitting & Enforcement, Anchorage. Hotel Captain Cook. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 19 **CO**
Dying of Thirst: Right to Water in a Globalized World Symposium - Rivers of Conflict Panel, Denver. University of Denver. Sponsored by Center on Rights Development. For info: www.centeronrightsdevelopment.org

April 19 **WEB**
Private Sector Role in Site Cleanup: The Regulatory Perspective Course, WEB. For info: NGWA: www.ngwa.org

April 19-20 **CA**
Developing & Writing Effective CEQA Documents Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

April 19-20 **CA**
Planning & Environmental Law Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

April 23 **OR**
Water Quality: Toxics & Water Quality Standards Conference, Portland. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, hduncan@elecenter.com or www.elecenter.com

April 24-25 **WA**
Low Impact Development Workshop: Permeable Paving, Puyallup. WSU LID Research Facility. For info: <http://cm.wsu.edu/ehome/index.php?eventid=34097&>

April 25 **WA**
GoGreen '12 Seattle Conference, Seattle. For info: http://seattle.gogreenconference.net/event_details/

April 25 **WEB**
Life Cycle of Groundwater Data - From Field to Lab to Electronic Data Deliverable to Report (Course), WEB. For info: NGWA: www.ngwa.org

April 25 **OR**
Transport of Viruses in Partially Saturated Soil & Groundwater Lecture, Corvallis. OSU - ALS 4000, 4-5pm. Sponsored by Institute for Water & Watersheds. For info: <http://water.oregonstate.edu/sponsored-events>

April 25-26 **OR**
Oregon Future Energy Conference, Portland. Oregon Convention Ctr. Presented by Northwest Environmental Business Council & Oregon Solar Energy Industries Ass'n. For info: Sue Moir, NEBC, 503/ 227-6361, sue@nebc.org or www.nebc.org

April 26 **OR**
Clean Water Act Case: NEDC v. Decker (Brownbag), Portland. Schwabe Williamson & Wyatt, 1121 SW 5th Ave., Ste. 1900, Noon-1:15pm. Sponsored by Environmental & Natural Resources Section (Oregon BAR). For info: RSVP: Anzie.Nelson@portofportland.com

April 26 **CO**
Site Characterization: The Groundwater System Course, Denver. Hampton Inn - Downtown. For info: NGWA: www.ngwa.org

April 26-27 **CA**
Understanding Riparian Processes Course, Davis. Da Vinci Bldg., 1632 Da Vinci Ct. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

April 26-27 **CO**
David Getches Symposium, Boulder. Wolf Law Building - CU. Sponsored by Natural Resources Law Center. For info: <http://lawweb.colorado.edu/apps/eventRegistration/getchesSymposium/>

April 26-27 **CO**
Federal Regulation of Cultural Resources, Wildlife, & Waters of the U.S. Institute, Denver. Marriott City Center. Sponsored by Rocky Mt. Mineral Law Foundation. For info: Mark Holland, RMMLF, 303/ 321-8100 x106, mholland@rmmlf.org or www.rmmlf.org

April 26-27 **OR**
Pacific Northwest Timberlands Management Seminar, Portland. World Forestry Ctr. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 26-27 **CO**
Fundamentals of Groundwater Geochemistry Course, Denver. For info: NGWA: www.ngwa.org

April 27 **OR**
Oregon League of Conservation Voters Annual Celebration for the Environment, Portland. Oregon Convention Ctr. For info: <http://olcv.org/node/6120>

April 27 **MT**
Wetlands Seminar, Helena. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 27 **CA**
SCWC Quarterly Meeting & Luncheon, Industry. Pacific Palms Hotel. Sponsored by the Southern California Water Committee. For info: ekorenberg@fionahuttonassoc.com or www.socalwater.org/images/SCWC_Q2-2012_Flyer.pdf

April 28-29 **CA**
Investing in Our Water Future: Focus on California Seminar, Santa Barbara. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

April 30-May 4 **OR**
National Water Quality Monitoring Council 8th Water Quality Monitoring Conference, Portland. Sponsored by National Water Quality Monitoring Council. For info: <http://acwi.gov/monitoring/conference/2012/index.html>

May 1-3 **MT**
MSAWWA/MWEA Annual Conference, Billings. Holiday Inn Grand. Sponsored by MT Sect. American Water Works Ass'n & MT Water Environment Ass'n. For info: www.montana-awwa.org/2012-conference

May 2 **OR**
Innovation in Water Purification Technology Lecture, Corvallis. OSU - ALS 4000, 4-5pm. Sponsored by Institute for Water & Watersheds. For info: <http://water.oregonstate.edu/sponsored-events>

May 2-4 **WA**
2012 PNWS-AWWA Conference, Yakima. Yakima Convention Ctr. Sponsored by Pacific NW Section - American Waterworks Ass'n. For info: www.pnws-awwa.org/SectionIndex.asp?SectionID=60

May 2-4 **OR**
Living Future Sixth Annual Conference: Women Reshaping the World, Portland. Hilton Executive Tower. For info: <http://cascadiagbc.org/living-future/12>

May 3 **DC**
Wetlands Law & Regulation Course, Washington. Hunton & Williams Law Office. Offered by ALI-ABA; WEBCAST Available. For info: www.ali-aba.org/

May 6 **CA**
Contaminant Hydrogeology of Karst (#305) Course, Garden Grove. For info: NGWA: www.ngwa.org

May 6-10 **CA**
2012 National Ground Water Ass'n Ground Water Summit: Innovate & Integrate, Garden Grove. Hyatt Regency Orange County. For info: NGWA: <http://info.ngwa.org/servicecenter/Meetings/Index.cfm?meetingtype=cf>

May 8 **UT**
Keeping Pace With the Ebb & Flow of Utah's Water Needs: AWRA Utah Section Annual Conference, Salt Lake City. Sponsored by American Water Resources Ass'n Utah Section. For info: <http://state.awra.org/utah/node/18>

May 8-9 **WA**
Low Impact Development Workshop: Green Roofs, Low Impact Foundations & Rain Water Collection, Puyallup. WSU LID Research Facility. For info: <http://cm.wsu.edu/ehome/index.php?eventid=34097&>

May 8-11 **CA**
ACWA 2012 Spring Conference & Exhibition, Monterey. Conference Ctr., Portola & Marriott Hotels. For info: Ass'n of California Water Agencies, www.acwa.com/content/event-registration

May 8-11 **CA**
2012 National Mitigation & Ecosystem Banking Conference, Sacramento. Sheraton Grand Sacramento & Convention Ctr. For info: <http://mitigationbankingconference.com>

May 10-11 **CA**
Groundwater Economics Course, Garden Grove. For info: NGWA: www.ngwa.org



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CALENDAR

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May 11 OR

Tight Lines Auction & BBQ Dinner, Bend. Shevlin Park, 5:30pm. Sponsored by Deschutes River Conservancy. For info: <http://tightlines2012.eventbrite.com/>

May 13-18 Ireland

World Congress on Water, Climate & Energy, Dublin. Sponsored by International Water Ass'n. For info: <http://iwa-wcedublin.org/>

May 15-17 MT

Effective Water Quality Monitoring Workshop, Helena. Feathered Pipe Ranch. Sponsored by Montana Watershed Coordination Council. For info: www.mtwatersheds.org/Services/TrainingWorkshops.html

May 15-18 NV

Environmental Awareness Bootcamp, Las Vegas. Residence Inn Las Vegas Hughes Ctr. For info: EPA Alliance Training Group, 713/ 703-7016 or www.epaalliance.com

May 16 NM

Little Rio Grande Adjudication Overview (Luncheon), Albuquerque. O'Neil's Pub on Central, 11:30am-12:30pm. Sponsored by AWRA State Section. For info: http://state.awra.org/new_mexico/index.html

May 16 CA

Overview of Water Law & Policy in California Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

May 16 AK

Water in Alaska: Changing Environment of Permitting & Enforcement, Anchorage. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

May 17 WA

Tribal Water in the Northwest Seminar, Seattle. WA State Convention Ctr. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

May 18 CA

Water: Get in the Game! - 5th Annual OC Water Summit, Anaheim. Grand Californian Hotel at Disneyland Resort. For info: www.OCWaterSummit.com

May 18 OR

Water Research Symposium, Corvallis. OSU Memorial Union. Sponsored by Water Resources Graduate Program & the Hydrophiles. For info: <http://groups.oregonstate.edu/hydro/2012-osu-water-research-symposium>

May 20-24 OR

2012 Land Grant & Sea Grant National Water Conference, Portland. Mariott Waterfront. For info: www.usawaterquality.org/conferences/2012/default.html

May 22-23 WA

Low Impact Development Workshop: Site Planning, TESC, Plan Review & Inspection, Puyallup. WSU LID Research Facility. For info: <http://cm.wsu.edu/ehome/index.php?eventid=34097&>

May 22-24 NV

2012 Tahoe Science Conference - Environmental Restoration in a Changing Climate, Incline Village. Sierra Nevada College. For info: <http://tahoescience.org/events/conferences/>

May 23 CA

Addressing Nitrate in California's Drinking Water: SWRCB Public Hearing on SBX21, Sacramento. CalEPA Bldg. For info: <http://groundwater.nitrate.ucdavis.edu/Calendar/?calitem=158539&g=48492>

May 23 OR

The Transafrican Hydro-Meteorological Observatory Lecture, Corvallis. OSU - ALS 4000, 4-5pm. Sponsored by Institute for Water & Watersheds. For info: <http://water.oregonstate.edu/sponsored-events>

May 23 WA

Permitting Residential, Commercial & Industrial Projects Seminar, Seattle. WA State Convention Ctr. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

May 24-25 CA

Flood Management Tour (Field Trip), Stockton. Sponsored by Water Education Foundation. For info: www.watereducation.org/toursdetail.asp?id=1207&parentID=821

May 25 WA

Fisheries & Hatcheries Legal Frameworks Seminar, Seattle. Crowne Plaza, 1113 Sixth Ave. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

May 30 MT

Montana Wetland Council Meeting, Lewistown. For info: Lynda Saul, MDEQ Wetland, 406/ 444-6652 or <http://deq.mt.gov/wqinfo/wetlands/wetlandscouncil.mcp>

June 3-6 MO

Collection Systems 2012 Conference & Exhibition: Show Me the Green - Confluence of Planning, Implementation & Regulations, St. Louis. St. Louis Convention Ctr. For info: Water Environment Federation, 800/ 666-0206 or www.wef.org/CollectionSystems

June 3-7 Australia

9th IWA Leading Edge Technology Conference on Water & Wastewater Technologies, Brisbane. Brisbane Convention & Exhib. Ctr. Sponsored by Intern'l Water Assoc. For info: www.let2012.org/